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TRUTHS ABOUT THE SERUM DIAGNOSIS OF SYPHILIS

WITH ESPECIAL REFERENCE TO THE KOLMER AND KAHN REACTIONS *

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So much has been written about the serum diagnosis of syphilis and especially about the Wassermann test that one naturally hesitates to add anything more to the overburdened literature. Yet the subject is one of great importance because of the widespread distribution of the disease and the many difficulties of diagnosis, especially in its chronic and concealed stages as well as in treated and atypical cases.

It is almost impossible, however, at least for me, to arrive even approximately at the truth in this subject through a review of the literature, and it is indeed unfortunate that so many of its untruths are still being propagated by writers on the subject. Few are in better position than I to appreciate the tremendous influence of technic and methods as well as of the individual skill and carefulness of the serologist on the results of serum reactions in syphilis, and I believe that many of the conclusions arrived at by numerous writers and not a few of the impressions prevalent among the medical profession are erroneous and far from the scientific truth because based on defective laboratory work as well as on inadequate and mistaken clinical diagnoses.

Therefore when I attempt to express what I believe are truths in the serum diagnosis of syphilis I will confine myself largely to the results observed with my own modification of the Wassermann test and especially in my own laboratory. This test, which has been now in use for seven years, is based on several years of extensive and arduous research on the complement fixation reaction for the purpose of evolving a method of maximum sensitiveness and specificity. Furthermore, I enjoy the rather unique and exceptional privilege of many years of experience not only in the serology and pathology of syphilis but likewise in its clinical diagnosis and treatment, which I hope makes it possible for me to express a more accurate opinion of the sensitiveness, specificity and practical value of serum reactions than is possible for one whose experience is entirely laboratory or clinical, since it is but natural for either the serologist or the clinician to overemphasize the matter, consciously or unconsciously, according to the particular field in which he has been working. While serologists have a tendency to minimize the sources of technical and biologic error, clinicians may err just as greatly in the direction of overemphasizing these and placing too high an opinion on their clinical judgment as arbiters of the specificity and sensitiveness of the serum reactions. It is true that clinical judgment should rule, as it does in my own practice even though I do my own serum tests, but I really believe that errors in the clinical diagnosis of syphilis are likewise numerous, as is so well known of clinical diagnoses in other fields of medicine. It is indeed foolish for either a serologist or a clinician to rely on himself alone in the diagnosis and treatment of syphilis since the special skill of both is so frequently required and since, in the final analysis, only the pathologist skilled in the detection of the gross and microscopic lesions of syphilis is to be regarded as the arbiter of diagnostic disputes and the court of final opinion on the question of the sensitiveness and specificity of reactions.

Of course it is impossible for any one man even to think that he is alone capable of learning the whole truth about the serum diagnosis of so protean a disease as syphilis, so that I am not so foolish as to rely on my own clinical judgment and serum reactions alone but will draw on the well conducted and controlled investigations of others with various complement fixation and precipitation tests for arriving at what I believe are truths in this hackneyed but important subject. Nor am I foolish enough to think that what is presented here as established truth is or will be accepted without argument and dissension, as after all a physician will judge more by his own personal experience than by what he hears or reads of the experiences and beliefs of others; yet these facts are unvarnished truths as revealed to me during the past eighteen years of earnest effort to learn them and are presented with the conviction that they will meet with the approval of not a few especially interested in the broad and important field of syphilology.

Technic has so great an influence on serum reactions that I will express the results of my personal experience (1) in syphilitic and nonsyphilitic cases in my own practice in which the serum tests were conducted wholly or in large part by myself with more than ordinary care and with the possibility of the mislabeling of specimens and technical errors reduced to a minimum, and (2) in serum tests conducted by technicians but under my general supervision with specimens submitted by the staff of the Graduate Hospital of the University of Pennsylvania, who were likewise directly responsible for the clinical diagnoses and indirectly involved in the occasional mislabeling of specimens, a regrettable

* Read before the Medical Society of Delaware, Oct. 10, and the Buffalo Academy of Medicine, Oct. 23, 1929.

* From the Laboratories of the Graduate School of Medicine of the University of Pennsylvania and the Research Institute of Cutaneous Medicine of Philadelphia.

accident sometimes occurring in busy clinics and offices and the consequent mistakes of which are usually ascribed to laboratory error.

THE FIRST TRUTH

But if it is impossible to derive the truth from a study of the literature alone, it may be stated that its very volume, containing as it does extravagant praise and claims as well as numerous criticisms, and loaded with untruths based on defective work and methods largely perpetrated in the name of the "Wassermann reaction," is evidence of the first truth in this subject; namely, that there must be something of real and intrinsic value in the Wassermann reaction and the serum diagnosis of syphilis in general for the subject to have withstood the vicissitudes of twenty-five years of time and remain today one of the most valuable laboratory tests known to medical science.

THE SECOND TRUTH

The second truth is in the nature of a paradox; namely, that while the Wassermann, Kahn and other complement fixation and precipitation reactions are biologically nonspecific, because they are the result of an interaction between an extract of lipoids from beef heart or other nonsyphilitic tissue called "antigen" and an antibody in the serum or spinal fluid engendered by *Spirochaeta pallida*, yet they possess an extremely high degree of practical specificity under proper technical conditions, because this type of antibody is produced with certainty in only one other disease, namely, frambesia tropica, or yaws, which is quite rare in the United States.

NONSPECIFIC REACTIONS

A somewhat analogous condition exists in typhus fever, since the serum in this disease usually contains an antibody yielding positive complement fixation and agglutination reactions with an antigen of *B. proteus-vulgaris*, an organism which apparently has no etiologic relationship at all to the disease but yet is capable of yielding these biologically nonspecific but practically highly diagnostic reactions, since a similar antibody for *B. proteus* is not found in other acute infectious diseases.

In 1922 I emphasized the necessity for dividing the errors of the Wassermann and other serum reactions in syphilis into (*a*) this biologic and therefore unavoidable type because produced by the same kind of antibody as occurs in syphilis and (*b*) those which are technical and therefore avoidable by proper attention to technical details.

The question arises whether there are diseases other than syphilis and yaws capable of yielding truly or biologically positive Wassermann reactions. Even as recently as this year two leading syphilologists, Stokes [1] and Goeckerman [2], have stated that falsely positive reactions may occur not only in frambesia, or yaws, but likewise in leprosy, tuberculosis, the acute exanthems and especially scarlet fever; pneumonia, septicemia and particularly subacute bacterial endocarditis; trypanosomiasis, relapsing fever, arthritis, general anesthesia, malignancy and especially hepatic cachexia; pernicious anemia, malaria, pregnancy, Weil's disease, and possibly diabetes and systemic mycotic infections.

Here indeed is where an expression of what I regard as the truth is likely to produce most discussion and dissension in opinion. But I have no hesitation whatever in stating that, according to my experience with my new method and antigen, biologic or unavoidable falsely positive reactions occur only in yaws and possibly in trypanosomiasis and relapsing fever because of the biologic relationship of the organisms of these diseases to *Spirochaeta pallida*. But in the other diseases I believe that positive reactions are due to technical conditions and therefore are avoidable.

In the first place it is to be remembered that, in any study of the specificity of the Wassermann and other serum tests for syphilis, some truly positive reactions are to be expected because of concealed or latent syphilis. Of course the incidence of these varies greatly according to social status and localities, but in the great American middle class I believe that they may be expected in at least 2 per cent of cases. In the tropics the incidence of syphilis is apt to be much higher and has greatly complicated studies on the occurrence of nonspecific Wassermann reactions in leprosy and malaria. Therefore before a nonsyphilitic disease can be regarded as yielding positive reactions, the incidence must be above the average level of syphilis as determined by an adequate number of control cases taken from the same class of individuals.

Probably most interest is to be placed in the possibility of nonspecific reactions in leprosy. Undoubtedly the serum in this disease, and particularly in cases of well advanced nodular leprosy, may yield positive Wassermann reactions with most methods in common use, but in a study of the new complement fixation test in this disease by Denney and myself [3] it was found that falsely positive reactions did not occur. Positive reactions were, of course, observed, but in these there was either historical or clinical evidence of syphilis, and I believe that the new test is not at all likely to yield nonspecific positive reactions in pure leprosy, primarily because of the fact that the dose of antigen employed is from thirty to fifty times less than its anticomplementary unit. With the old three-antigen method apparently false positive reactions occurred in at least 7 to 8 per cent of seemingly nonsyphilitic leprous patients in confirmation of numerous similar reports in the literature, but these were not observed with the new method and the Pinedas [4] have had a similar experience, stating in conclusion to their extensive studies in complicated and uncomplicated cases of leprosy in the Culion Leper Colony that their observations indicate that with the Kolmer reaction and other refined methods the Wassermann reaction is negative in uncomplicated cases in their ordinary phase; also that when the reaction is clearly positive in ordinary cases it has the same significance as in nonlepers.

Because of the wide prevalence of tuberculosis, the question of its producing falsely positive ractions is of considerable importance. A large literature indicates that the serum during high fever may give a false reaction with 0.4 per cent cholesterolized antigens, but I am quite sure that these reactions do not occur with my antigen and new method. At least Dr. Callahan and I observed none in a series of about 200 acute and chronic cases; some positive reactions occurred but only in those in whom syphilis was clinically present, and Kilduffe [5] has had a similar experience. Boas and

1. Stokes, J. H.: Ann Int. Med. **2**: 1139 (May) 1929.
2. Goeckerman, W. H. D.: Proc. Staff Meetings, Mayo Clinic **4**: 126, 1929.
3. Kolmer, J. A., and Denney, O. E.: Wassermann Reaction in Leprosy, Arch. Dermat. & Syph. **8**: 63 (July) 1923.
4. Pineda, E. V., and Roxas-Pineda, E.: Philippine J. Sc. **30**: 39 (July) 1926.
5. Kilduffe, R. A.: J. Lab. & Clin. Med. **9**: 124 (Nov.) 1923.

With [6] have recently stated that the chance of a tuberculous nonsyphilitic person giving a positive reaction is not more than 1 in 1,000, and whenever a positive reaction occurs it is necessary to suspect the coincident presence of syphilis.

And the same is true of the acute exanthems. Scarlet fever is certainly to be dropped from the list said to be capable of yielding nonspecific reactions. It is difficult to explain why so many investigators have observed positive Wassermann reactions unless their antigens and general technic were responsible. In 1911 I [7] found only 2 per cent of positive reactions in 250 cases, and none of a second series of thirty cases have reacted positively by my new method, serums being tested from the second day to the sixth week of the disease.

The same is true of lobar pneumonia and bronchopneumonia. In a series of thirteen cases, Steinfield and I [8] observed negative reactions in all except one syphilitic patient, and since our study I have tested the serums of fifty-two additional patients with lobar pneumonia before and after the crises with uniformly negative reactions. I am quite sure that pneumonia in nonsyphilitic persons does not give positive reactions with my method.

Numerous cases of other febrile diseases in nonsyphilitic individuals have also yielded uniformly negative reactions with my test, including nine cases of chronic ulcerative endocarditis (all due to *Streptococcus viridans*); fourteen cases of acute rheumatic fever; thirty-one cases of chronic arthritis; eleven cases of acute meningitis (meningococcic, pneumococcic and streptococcic); three cases of tuberculous meningitis; twenty-four cases of follicular tonsillitis; fifteen cases of acute and chronic furunculosis; thirty-two cases of acute and chronic gonorrhea; seven cases of acute Vincent's angina and numerous acute surgical diseases, such as osteomyelitis and cholecystitis. It is true that some obscure changes may occur in the blood during febrile diseases which increase the tendency to nonspecific reactions, particularly when 0.4 per cent cholesterolized extracts are employed as antigens; furthermore, it is well known that the serums tend to be more anticomplementary than usual. With my method the influence of these serum changes is reduced to a minimum or entirely removed, because the new antigen is prepared of beef heart, contains only 0.2 per cent of cholesterol, and is so free from anticomplementary activity that the usual dose of 10 antigenic units is from thirty to fifty times less than the anticomplementary unit. This, along with the daily titrations of complement and hemolysin, the use of defective complement serum and weak hemolysin being avoided, and a primary incubation at from 6 to 10 C. instead of at 37 C. are the biologic reasons for the specificity of the reaction for syphilis in those localities where yaws does not occur. On the other hand, when cholesterolized antigens, particularly those prepared of heterogenic guinea-pig heart, are employed in doses only four to ten times under their anticomplementary unit as is usual in other methods, the chances of securing pseudopositive reactions is greatly increased, especially in leprosy.

During the febrile stages of malaria, and especially when parasites are present in the blood, nonspecific positive reactions are said to occur and to disappear under quinine medication. But there is the widest divergence of results and opinions in the numerous articles that have been written on this subject. Some patients with positive reactions during life have shown evidences of syphilis after death, a striking case being recorded by McConnell; [9] in others, the lesions of syphilis could not be detected after death. But the wide prevalence of syphilis in tropical countries has added greatly to the difficulties in arriving at reliable conclusions.

In a series of tests with specimens of serum kindly furnished by Dr. Bates of Ancon, Panama, and Dr. Caldwell of the Public Health Service in Houston, Texas, I found the reactions uniformly negative in all but two patients in whom the possibility of syphilis could not be definitely excluded. Since then tests with the serums of twenty-six additional patients with tertian and estivo-autumnal malaria in whom the presence of syphilis could be excluded with a fair degree of accuracy have yielded uniformly negative reactions, and I am of the firm belief that the serums of nonsyphilitic malarial patients do not yield falsely positive reactions with my new method, even when blood is drawn just before, during or after a paroxysm of chills and fever. The occurrence of positive reactions in malaria is presumptive evidence of syphilis requiring careful clinical study, and this opinion is shared by other recent investigators. Furthermore, it is of significance that the Wassermann reaction in paretic patients artificially inoculated with benign tertian malaria in treatment are not stronger even after ten or more paroxysms over several weeks' time, sufficient for antibody production if such occurred; on the contrary, it has been my experience that the quantitative serum reactions with my method have become progressively weaker, even reaching negativity in some cases. Under these conditions it has appeared to me improbable that malarial parasites per se could produce the reagins responsible for positive Wassermann reactions. Indeed, some assert that high fever in acute measles or similar conditions may cause temporarily negative reactions in paresis and secondary syphilis, and I am far readier to accept this possibility in view of the clinical and serologic results being observed at present in the treatment of syphilis, particularly of the central nervous system, by malarial inoculation.

The same is true with the serums of nonsyphilitic pregnant women tested at or near term. In the experience of Smith,[10] the new test does not yield falsely positive reactions in this condition and my experience has been exactly similar. When positive reactions have occurred, they have remained positive after delivery in the majority of cases and have been observed only in syphilitic women. In this connection it is to be borne in mind that pregnancy may stimulate or provoke latent syphilis into activity just as trauma, intercurrent disease or the administration of arsphenamine may prove provocative, so that unexpected positive reactions may occur; but when these are observed with the new method I believe that syphilis is present rather than that the reactions are falsely positive because of metabolic, toxic or other changes in the serum in late pregnancy (as eclampsia). Kilduffe has had a similar experience in 201 cases. Furthermore, it would appear to be definitely established that the Wassermann reaction in pregnant syphilitic women may become negative

6. Boas, H., and With, C.: Hospitalstid. **66:** 69 (Jan. 31) 1923
7. Kolmer, J. A.: J. Exper. Med. **14:** 235, 1911.
8. Kolmer, J. A., and Steinfield, E.: J. Lab. & Clin. Med. **10:** 1 (Oct.) 1924.
9. McConnell, Guthrie: Positive Wassermann Test in Estivo-Autumnal Malaria, J. A. M. A. **80:** 1123 (April 21) 1923.
10. Smith, F. C.: Am. J. Syph. **6:** 705 (Oct.) 1922.

for a time after delivery and this is doubtless responsible for much of the confusion. Dr. A. W. Stillians[11] of Chicago states that, of fifty-two pregnant women giving positive reactions by my method during pregnancy, forty-one continued to do so after delivery while eleven reacted negatively, all of whom were regarded clinically as syphilitic. In his whole series of 6,954 pregnant women, mostly white, 6 per cent reacted positively; of 814 pregnant negro women, 19.2 per cent gave positive reactions, practically all of whom were regarded as syphilitic.

Recently Rockwood and Sanford have shown in a serologic study of 501 cases of diabetes that falsely positive Wassermann reactions are of rare occurrence in this disease. Among these were eight cases of probable coincidental syphilis with apparently false negative reactions in the serums of two by a modified Noguchi method and of one by my method; five yielded positive reactions, but in two of these the evidences of syphilis were not conclusive. In thirty-five patients studied by Steinfield and myself, with blood sugars of from 170 to 460 mg. per hundred cubic centimeters, several being in coma, the reactions were negative, and it is my firm conviction that positive reactions by the new method in diabetes and especially repeated positive reactions are always due to coincident syphilitic infection.

From time to time investigators have reported falsely positive Wassermann reactions with the serums of nonsyphilitic individuals with acute and chronic nephritis with high retention and especially in uremic coma. These may occur with some methods, but in a series of seventeen cases examined by Steinfield and myself showing from 21 to 179 mg. of urea per hundred cubic centimeters of blood, several being in uremic coma, completely negative reactions were observed with the new method. Since then a large number of additional cases have been tested in the medical clinics of the Graduate Hospital, Philadelphia, with similar results, so that I believe nephritis and uremia in nonsyphilitic individuals incapable of producing pseudoreactions.

Falsely positive Wassermann reactions have also been reported from time to time in individuals with jaundice. I have had no experience with acute yellow atrophy, but in cholecystitis, biliary cirrhosis and obstructive jaundice due to carcinoma of the pancreas occurring in nonsyphilitic individuals the reactions by my method have been uniformly negative in the experience of Steinfield and myself, and Rockwood and Beeler have had a similar experience. It is true that serums deeply tinged with bile products are to be carefully watched from the standpoint of anticomplementary reactions, but pseudopositive reactions are readily avoided.

I have never observed positive reactions in nonsyphilitic individuals after ether, chloroform and gas oxygen anesthesia by my method, specimens being taken during and again immediately after recovery from the effects. Nor have I observed these anesthetics to give falsely negative reactions in a smaller series (twelve cases) of syphilitic patients giving weak to strongly positive reactions.

During the past eight years a large number of cases of carcinoma, sarcoma and various nonmalignant tumors have been tested by the new method without the slightest evidence of nonspecific reactions, even though the literature contains numerous references to alleged falsely positive Wassermann reactions by various methods, especially in tumors of the central nervous system. It is true that positive reactions are sometimes encountered in cases presenting tumors, but so far these have occurred only in syphilitic individuals, in some of whom the tumors themselves were gummas.

Lead poisoning is another disease sometimes mentioned as capable of yielding nonspecific reactions. In five patients coming under my observation the reactions were completely negative in all but one, who gave a history of infection ten years previously with a brief course of mercurial treatment.

Nor have I observed positive reactions in cases of thyroid disease in nonsyphilitic persons (six cases of exophthalmic goiter and eleven of colloid goiter). I have had no experience with typhus fever, but all of eight cases of typhoid in which tests were made during the height of the disease have yielded negative reactions. Nor have I had any experience with kala-azar; but seven cases of granuloma inguinale, which may be a form of leishmaniasis, gave negative reactions as well as two cases of actinomycosis, as possible examples of systemic mycotic infections.

I hope that I may be pardoned for taking up so much space and time for the discussion of this subject of falsely positive reactions in nonsyphilitic diseases, but I consider it of prime importance and that it is necessary for me to present the evidence on which my statement is based; namely, that I believe it is a truth that falsely positive reactions are due to technical errors rather than to unavoidable biologic factors in nonsyphilitic diseases other than yaws and possibly relapsing fever and trypanosomiasis so far as my complement fixation method is concerned. Furthermore, I believe that it is essential and important for writers in syphilology to state carefully the method employed and the laboratory or serologist reporting to them what are believed to be falsely positive reactions and to repeat them at least once more before drawing conclusions in order to reduce to a minimum errors due to technic and therefore avoidable. They should study such cases with more than usual care for possible concealed and unsuspected syphilis, remembering that they, too, are human and may make clinical mistakes (as I have done) before drawing the conclusion that a biologic and unavoidable falsely positive reaction has occurred.

THE THIRD TRUTH

But while the Wassermann and other serum tests possess a high degree of practical specificity for syphilis in such countries as the United States, where yaws is rare, there can be no denial of the fact that falsely positive reactions are sometimes observed in other diseases and indeed in apparently healthy individuals, especially in routine work. In my experience, however, these are almost always due to technical errors, and I believe that it may be stated as the third truth that the Wassermann, Kahn and all other serum tests are subject to numerous technical errors and that these are almost entirely responsible for falsely positive reactions.

FALSELY POSITIVE REACTIONS

For example, I may mention in illustration at least one and possibly two falsely positive reactions from my laboratory in a series of forty-one tests on serums from healthy individuals varying from 18 to 45 years of age sent to me by Dr. Ruth Gilbert and Miss Virginia Langworthy in 1926 in the course of a study conducted

11. Stillians, A. W.: Reliability of Kolmer-Wassermann Reaction in Pregnancy, Arch. Dermat. & Syph. **17**: 318 (March) 1928.

under the auspices of the American Public Health Association. The first was a typographic error in that a report of a weakly positive reaction (1----) on serum 55 was sent in, whereas in truth the reaction was clearly negative and so recorded in my laboratory records. The second serum (number 230) gave a strongly positive reaction (442--). It was tested by one of the student technicians during my absence and reported on, even though it was known on that particular day that the complement serum was unsatisfactory because hypersensitive and that the test should have been repeated before the results were reported. I may state, however, that the Western Reserve University School of Medicine likewise gave positive Wassermann and Kahn reactions on this serum, although four other laboratories reported negatively and the referees considered the reactions falsely positive.

This question of specificity and falsely positive reactions is therefore of great importance in relation to the serum diagnosis of syphilis, and their occurrence may be so frequent in some laboratories that it is no wonder that some physicians entertain but a poor opinion of complement fixation and precipitation reactions in the diagnosis of syphilis.

Fifteen years of active laboratory experience has indeed taught me that in no other tests are technical errors so important and so likely to produce falsely positive and falsely negative reactions and, furthermore, that no other type of laboratory procedure requires more experience, skill, individual carefulness and eternal vigilance on the part of the worker in order to secure the best results. Even in the best of laboratories technical errors can occur in the Wassermann, Kahn and other serum tests, but it is obvious that their occurrence is in proportion to the skill and carefulness of the serologist. They are always more numerous in the course of routine work than in one's own private work, and since research is usually conducted with much more care than routine work it is a general rule that the incidence of falsely positive reactions has usually been lower in special research studies than is found in statistical analyses of routine tests over any given period of time, because of the greater attention to technical details.

Some methods are technically incorrect so that no matter how carefully they are done the results are poor. Others are technically correct, but if the reagents and especially the antigen are defective, the results cannot be good despite all the care in the world in conducting them. In other words, technical errors may be inherent in the method or may creep into the best of methods; therefore the aim of the serologist should be to select the technically most perfect methods and then conduct them with research accuracy and care.

As an example, I present in the accompanying tabulation the results observed last June in the Conference on Biological Standards under the auspices of the Health Organization of the League of Nations in Copenhagen, in which falsely positive reactions were believed to vary from 2.7 to 15.2 per cent among seven complement fixation methods and from 0.2 to 14.3 per cent among seven precipitation tests. It is to be remembered that the serums were sent in from different European clinics and that some at least may have come from unsuspected syphilitic individuals; but it is no wonder that Dr. John H. Stokes later wrote [12] that "the proportion of false or nonspecific positives obtained by some of the older Wassermann procedures, even with multiple antigens, appeared alarming and almost unbelievable. It applied, not alone to partial positives and weak positives, which every one today should have learned to regard with caution, but even to strongly positive serologic results. If under the relatively controlled conditions of such a comparative study 35 per cent of the reports by a certain procedure can be nonspecific, it can be readily imagined that under less controlled conditions there must be laboratories which are veritable mills of false reports, fastening suspicion of syphilitic infection right and left upon persons who do not have the disease." [13]

Results of Serum Tests Conducted in Conference on Biologic Standards *

Methods	Number of Tests	Number Positive	Per Cent Positive
DeBlasi Wassermann	397	47 †	11.9 †
Calmette-Massol Wassermann	249	36	14.4
Harrison-Wyler Wassermann	435	12	2.7
Jacobsthal Wassermann	435	66	15.2
Original Wassermann (Otto-Blumenthal)	435	64	14.6
Original Wassermann (Pavlovitch)	434	31	7.1
McIntosh-Fildes Wassermann	435	13	3.0
Kahn precipitation (by Boas)	435	9	2.1
Kahn precipitation (by Kahn)	434	5	1.2
Meinicke turbidity (by Meinicke)	435	22	5.1
Muller conglomeration (by Muller)	432	11	2.6
Murata precipitation (by Nagayo and Nobechi)	432	60	14.0
Sachs-Georgi precipitation (lentochol)	431	1	0.2
Sachs-Georgi precipitation (citochol)	427	2	0.5
Sigma precipitation (by Norel)	434	41	9.5
Vernes precipitation	369	53	14.3

* Taken from table A of the report on the Second Laboratory Conference of the Health Organization of the League of Nations.
† Includes ± reactions.

It will be a matter of lasting regret to me that I was unable to accept an invitation to attend the conference, but in truth I did not gather its importance from the letter received from Dr. Madsen as otherwise I could readily have sent a trained technician capable of conducting my method in an acceptable manner. But it is comforting to learn from a recent communication from the clinic of Dr. Stokes, by Drs. McIntyre and Gilman,[14] that the proportion of falsely positive reactions by my method in a series of 373 tests on individuals with miscellaneous dermatoses, and in cases under investigation for syphilis which proved negative, was only 0.4 per cent, the Kahn test yielding 2.9 per cent reactions.

I believe, therefore, that it is an established truth that the great majority of falsely positive reactions in the serum diagnosis of syphilis are due to methods inherently faulty or to errors in technic in conducting methods inherently sound and acceptable. And the chances for technical errors will always remain, since every test is subject to it. None can be made error-proof regardless of safeguards and simplicity of technic. There is always the human equation. But errors can be almost entirely removed by skill, experience and conscientious effort. There is no excuse for mislabeling specimens, errors in making dilutions, the use of dirty glassware and defective reagents, or undue haste; and physicians should give up the pernicious habit of pressing laboratories for quick reports at the expense of accuracy, and all laboratories should abandon foolish competition on the basis of quick service. What is worth doing at all is worth doing well, and in no other

12. Stokes, J. H.: Ann. Int. Med. **2**: 1140 (May) 1929.

13. In a personal communication, Dr. Stokes states that he wishes to correct his published statement that as high as 35 per cent falsely positive reactions were observed, and that this should read approximately 15 per cent by some of the complement fixation and precipitation tests.

14. McIntyre, Mary C., and Gilman, R. L.: Serologic Studies, J. A. M. A. **93**: 358 (Aug. 3) 1929.

branch of laboratory diagnosis is this dictum truer than in the serum diagnosis of syphilis. Enough harm has been done by insufficiently trained and inexperienced technicians to call a halt on the practice of submitting the serum diagnosis of so important a disease to their unsupervised care. Any test conducted in a blind manner by putting this and that in a test tube in such and such amounts must come to grief sooner or later. The worker should appreciate the necessity of thoroughly understanding the reagents and be able to analyze difficulties and possible sources of error.

THE FOURTH TRUTH

Fortunately, however, technical errors and therefore falsely positive reactions can be reduced to a minimum by physicians demanding at least two tests on each serum, such as a complement fixation and a precipitation procedure, instead of relying on either alone, by exercising more care in the selection of laboratories, and by showing preference when possible for those in closest contact with clinical material for checking up technic and results. Under these technical conditions I believe that it may be stated as a fourth truth that serum tests are indispensable aids in diagnosis, that positive reactions are sometimes the only definite evidences of syphilitic infection, and that not infrequently they are the sole means for detecting syphilis in its chronic and concealed stages.

It is sometimes stated that syphilis should never, or can never, be diagnosed in the laboratory. On the contrary, I believe that many cases can be diagnosed only in the laboratory and I am not ashamed or hesitant in stating that this is true in my own practice, although I can lay claim to a fair amount of clinical experience and diagnostic acumen.

There can be no denial of the menace of the single weakly positive reaction in the problem of false or pseudo syphilis but, on the other hand, there can be denial of the fact that the weakly positive reaction is sometimes the first definite link in the chain of syphilitic diagnosis, and serum tests are of particular value to the general practitioner who is not equipped for exhaustive clinical and special diagnostic examinations.

Weakly positive reactions should be at least repeated before being discarded, as it is possible to render them full of significance by proper technic; furthermore, a serologist should never employ any method in which he is suspicious of the accuracy of weakly positive reactions, and the physician does well to look with suspicion on any laboratory or serologist who is willing to apologize for weakly positive reactions that do not happen to fit in with clinical expectancy.

THE FIFTH TRUTH

It is in such difficult cases of obscure syphilis that at least two different tests are better than one, such as a Wassermann or complement fixation test in conjunction with one of the numerous precipitation or flocculation tests. When both are positive or negative, the evidence is stronger than that obtained with either alone, or one may be positive and the other negative and thereby aid in correct diagnosis. I believe that the mechanism of the Wassermann and Kahn reactions is fundamentally the same but that, when small amounts of antibody are present, the reactions may vary owing to technical conditions.

Despite strenuous efforts to substitute the Kahn or some other precipitation test for the Wassermann test, I believe that it may be stated as a fifth truth that the serum diagnosis of syphilis is best served by employing at least both tests whenever this is possible.

Altogether too much emphasis has been placed on the alleged simplicity and rapidity of the Kahn test; in truth, it likewise requires considerable skill and experience and its weakly positive reactions are much more difficult of reading and interpretation. Furthermore, it is likely to yield more nonspecific or falsely positive reactions than my modification of the Wassermann test. Altogether too much emphasis has been placed on a mere comparison and substitution of the Kahn test for various complement fixation tests masquerading under the general name of "Wassermann test" without sufficient attention being paid to the technic of the latter or to the clinical status of the patients examined. What is urgently needed are studies like those of McIntyre and Gilman, previously referred to, in which the tests are evaluated not so much in relation to one another as in relation to clinical diagnoses based on thorough clinical examination.

As stated by these investigators, "sufficient evidence is not on hand to warrant the supplanting of one test by the other, and the clinician and his patient are best served by the performance of both tests." This conclusion is based on 1,767 Kolmer and Kahn tests in the clinic of Dr. Stokes in which both agreed in 83.3 per cent of proved syphilitic cases and 96.7 per cent of proved nonsyphilitic cases. Of the 16.7 per cent disagreement in the syphilitic individuals, 12.9 per cent were positive with the Kolmer and 3.8 per cent were positive with the Kahn test. Of the 3.3 per cent disagreement in the nonsyphilitic cases, the Kolmer was positive in 0.4 per cent and the Kahn in 2.9 per cent.

In the private offices of physicians and small laboratories, the Kahn, Meinicke or some other precipitation test has tended to replace the Wassermann test because it does not require complement, sheep cells or hemolysin, and this is justifiable if the latter test cannot be done; but matters of convenience should not be permitted to obscure scientific truth and the best interests of the serum diagnosis of syphilis which, I believe, is as stated, that both tests should be conducted. Which should be chosen when only one may be done is a matter of personal opinion and preference; for my own part I prefer the complement fixation test because it is less likely to yield nonspecific reactions and is much more easily read and interpreted. Indeed, I believe that dependence on the Kahn test alone by inexperienced technicians has already added to the unfavorable attitude of physicians toward the serum diagnosis of syphilis and has further complicated the problem of diagnostic snarls in cases of disputed syphilis.

THE SIXTH TRUTH

While up to this point the positive reaction has chiefly engaged my attention, it must not be overlooked that the margin of error is indeed much more likely to be on the side of falsely negative reactions, especially in the diagnosis of syphilis in women and children. For this reason I believe it may be stated as a sixth truth that the various serum tests for syphilis are not too sensitive but rather are not sensitive enough.

I believe that the strength or degree of the complement fixation and precipitation reactions is in proportion to the degree of spirochetal activity, even though this may not bear a relation to the clinical aspects because signs and symptoms may depend more on where the organisms are located than on the numbers present. Therefore relatively few organisms may produce signs

of syphilis while too few to produce sufficient antibody for detection in the test tube; this is especially true in tabes dorsalis, syphilis in child-bearing women and late congenital infections in children. Just how much spirochetal activity is required to produce enough antibody for positive reactions is not known and probably never will be; but it is apparent that the detection of small amounts varies with technic and that it may be impossible ever to render any serum test sufficiently sensitive for the detection of all extremely latent infections, although the provocative procedure still further reduces the incidence of falsely negative reactions.

The important lesson to be learned by the majority of practitioners is not to ignore positive reactions but to distrust negative reactions, and never to accept a single negative as excluding syphilis when suspicious clinical signs or history are present. This is particularly important when it is remembered that the antibody responsible for the Wassermann and precipitation tests may fluctuate almost daily within rather wide limits.

THE SEVENTH TRUTH

The percentage of falsely negative reactions, however, can be and has been greatly reduced by improved methods since the original Wassermann test was described as the result of research work aiming to evolve methods combining the maximum degree of sensitiveness consistent with specificity. And since syphilis may attack almost every organ of the body, it is a disease that concerns every specialty in the practice of medicine and surgery. But it is impossible to express accurately the incidence of the disease and therefore its clinical expectancy in practice, although this has been estimated as varying between 6 and 10 per cent.

This is high enough to warrant and indeed demand the routine serologic examination of all dispensary and ward patients and to justify its inclusion in the complete examination of the majority of private patients. A great deal of the time devoted in hospital laboratories to useless routine urine and general blood examinations could be much better spent in conducting routine complement fixation and precipitation tests on all patients, including those occupying private rooms, so that I believe it may be stated as a seventh truth that the serum tests for syphilis are worthy of being more widely employed as routine measures in the practice of medicine and surgery and its specialties. I have given elsewhere [15] a text-book summary of the percentages of positive reactions by my method in the various stages of syphilis, and I believe it may be stated that these are high enough in all but the first week or two of the chancre stage to warrant the routine use of serum tests as aids in diagnosis or for the purpose of confirming the diagnosis in the great majority of syphilitic patients.

The discomfort attending the taking of blood for serum tests is so negligible as not to require discussion. The cost, however, constitutes an important item, especially for private patients. Every hospital laboratory, however, can afford to do the serum tests as a routine; private room patients should be charged a moderate fee, and it is easily possible for hospital laboratories to be self-supporting with efficient personnel and equipment. The fees charged patients in private practice even for routine tests represent a wise investment in the great majority of cases, while serologists as a group are just as ready to render their services gratuitously to the needy poor in dispensary and private practice as are clinicians.

THE EIGHTH TRUTH

If complement fixation and precipitation reactions are due to antibodies or reactionary substances produced by *Spirochaeta pallida* and therefore are reactions of infection, as I believe the evidence indicates, I see no escape from the conclusion that repeatedly positive reactions after rest periods following treatment are indexes of continued infection, even though they occur in individuals in apparent good health. This does not always mean that treatment should be continued merely to remove this positive quality of the serum if there are contraindications, but in my opinion it does mean that the patient is syphilitic and must be carefully watched for relapses. In a fairly extensive clinical experience in the treatment of syphilis, I have seen so many relapses follow cessation of antisyphilitic medication among those tired of the "tyranny" of persistently positive reactions, especially weakly positives, that I believe a heavy responsibility rests on any physician, regardless of his experience, who deliberately ignores them in the treatment of the disease. Indeed, I believe that it may be stated as an eighth truth that acceptable serum tests are valuable aids in guiding the treatment of syphilis and as criteria of cure, especially those that give a real quantitative reaction rather than the ordinary tests conducted with only one or two doses of serum. Vernes [16] has stated that "there are two kinds of syphilitics, those treated under control of graphological serum tests and those who are not"; that "the former have nothing to fear, either for themselves or for their surroundings or for their progeny," and that "the others perpetuate syphilis and take their chance."

One need not subscribe to so extreme a view without admitting that efficient treatment gradually reduces the degree of complement fixation and precipitation in the majority of cases and that one of the most comforting and reassuring results is a persistently negative reaction by a sensitive and reliable method over years of time combined with the total absence of clinical evidences of infection. On the other hand, I have had but few cases of Wassermann-fast syphilis in my practice in which some evidences of infection were not found by combined clinical, roentgenologic and serum studies and I am convinced that all require observation and periodic courses of treatment to reduce to a minimum the chances of clinical relapses.

THE NINTH TRUTH

Indeed, I believe that it may be stated as a ninth truth that positive serum reactions are frequently and usually the first signs of relapsing syphilis following insufficient treatment or no treatment at all. It is commonly observed weeks and months before clinical signs are evident and especially in late syphilis. For this reason periodic blood tests (twice a year) for several years are the best means available for detecting relapses following the dismissal of our patients from treatment, although I do not by any means underrate thorough physical examinations for relapsing chancres (monorecidives), delayed and recurring secondaries, neurorecurrences, precocious tertiarism, the development of cardiovascular, ocular, visceral and skeletal lesions, and the birth of syphilitic children.

And in my experience the prompt institution of treatment, following the detection of serologic relapses,

15. Kolmer, J. A.: Serum Diagnosis by Complement Fixation with Special Reference to Syphilis, Philadelphia, Lea and Febiger, 1928, p. 483.

16. Vernes: Studies and Publications from the Institute prophylactique, Paris, A. Maloine and Fils, number 3.

has been the means of preventing or at least greatly delaying the development of clinical relapses.

THE TENTH TRUTH

Finally, I believe that it may be stated as a tenth truth that spinal fluid examinations are now recognized as an important and integral part of the complete diagnosis and treatment of most cases of syphilis. Owing to the greater inconvenience attending spinal puncture, the routine examination of spinal fluids cannot and need not be as frequent as routine blood tests. But every case of syphilis requires at least one or two complete examinations of the fluid for total cells, protein, complement fixation and colloidal gold or mastic reactions for diagnostic purposes and as a check on the results of treatment. In all cases of primary and secondary syphilis there should be a routine examination of this kind after a thorough course of treatment to determine whether or not infection of the central nervous system is present, since the results influence the balance of the therapeutic program. And no study of latent or tertiary syphilis including relapsing infections can even begin to be complete without a thorough examination of the fluid, especially since anywhere from 10 to 25 per cent may show negative blood reactions and positive spinal fluid changes. Furthermore, in latent cases infection of the central nervous system may readily escape detection by the most expert neurologists.

In my experience the Kahn and other precipitation tests have not been satisfactory, but the Wassermann test has been invaluable and even more specific and less likely to yield nonspecific reactions than is true of serum tests.

SUMMARY

All ten of the propositions which I accept as established truths in the serum diagnosis of syphilis may be briefly summarized as follows:

1. There must be something of real and intrinsic value in the Wassermann reaction and the serum diagnosis of syphilis in general for the subject to have withstood the vicissitudes of twenty-five years of time and remain today one of the most valuable of laboratory tests known to medical science.

2. While the Wassermann, Kahn and other serum reactions in syphilis are biologically nonspecific, they possess an extremely high degree of practical specificity under proper technical conditions.

3. The Wassermann, Kahn and all other serum tests are subject to numerous technical errors, and these are almost entirely responsible for falsely positive reactions.

4. Serum tests are indispensable aids in diagnosis. Positive reactions are sometimes the only definite evidences of syphilitic infection and are not infrequently the sole means for detecting syphilis in its chronic and concealed stages.

5. The serum diagnosis of syphilis is best served by employing two or more procedures as a complement fixation and precipitation test of proved merit.

6. The various serum tests for syphilis are not too sensitive but rather are not sensitive enough.

7. The serum tests for syphilis are worthy of being more widely employed as routine measures in the practice of medicine and surgery and its specialties.

8. Acceptable serum tests are valuable aids in guiding the treatment of syphilis and as criteria of cure, especially quantitative reactions.

9. Positive serum reactions are frequently and usually the first signs of relapsing syphilis following insufficient treatment or no treatment at all.

10. Spinal fluid examinations are now recognized as an important and integral part of the complete diagnosis and treatment of most cases of syphilis.

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PUERPERAL MORBIDITY AND MORTALITY

WITH ESPECIAL REFERENCE TO THE EFFECTS OF PREVIOUS INFECTION AND OPERATIVE DELIVERY *

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If statistical studies throw any light on maternal mortality, it is certain that:

1. Six or seven women out of every thousand confined die from causes directly or indirectly related to pregnancy, labor and the puerperium.

2. There has been no improvement in maternal mortality records in the United States during the past ten years. In 1915 the maternal mortality rate in the registration area was 6.1, in 1920, 8, and in 1927, 6.7 per thousand births. Such statistics in the face of the advances made in prenatal study and supervision suggest that women are not receiving clean or scientific intrapartal care and that something is wrong with the teaching and training given to the undergraduate.

3. More than 40 per cent, or two fifths, of all maternal deaths are due to infection, supposedly a preventable cause, while 27 per cent are chargeable to the toxemias and eclampsia, also preventable conditions. Of the remaining 33 per cent, 10 per cent may be allocated to dystocia and operative labor, some of which should be added to the fatalities from infection. The remainder can be credited to the accidents of pregnancy and labor.

That much of this human wastage is preventable is not debatable; yet what is the practical solution? We are conducting widespread campaigns advising women to seek prenatal advice; elaborate popular treatises have been written on the subject and have been broadcast by health officials, the Bureau of Child Welfare and the maternity center associations. The public is making a demand for better service, but apparently it is not getting it; otherwise these statistics cannot be accepted as reliable. Antenatal, intranatal and postnatal attendance should be consecutive. The woman who receives antenatal care should be admitted to the hospital in the service of men or women who have been watching over her. What is the use of diagnosticating a toxemia or a placenta praevia or a contracted pelvis if labor is to be conducted by one who is untrained in the proper management of such conditions? To many, the term contracted pelvis means operative labor, cesarean section or forceps; yet clinical experience has taught the man trained in obstetrics that from 60 to 80 per cent of the labors in relatively contracted pelves terminate spontaneously. Operative labor always means trauma, while trauma implies blood loss, which in turn lowers the resistance and favors the development of infection.

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* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

Maternal mortality should include all deaths due to childbirth from diseases or conditions caused by pregnancy and the complications and accidents of labor and of the puerperium. These are:

1. Infections, which make up the greater number.
2. Diseases of pregnancy and labor, such as: hyperemesis, and pregnancy associated with nephritis, preeclampsia and eclampsia, which run a close second.
3. The hemorrhages and accidents, such as: abortion; placenta praevia; ablatio; postpartum hemorrhage, and inversion.
4. The dystocias resulting from malposition, contracted pelvis and atresias, necessitating operative labors associated with complications; rupture of the uterus. Emboli, shock and heart failure make up the remainder.

The contributing causes to this high maternal mortality may be summarized under:

Lack of prenatal care.
Lack of aseptic practice and conscience.
Too much interference with normal labor.
Unnecessary cesarean sections.
The undue value placed on the child's life, increasing maternal risk, cross-infections in both private and hospital practice, and the hurrying of labor with solution of pituitary.

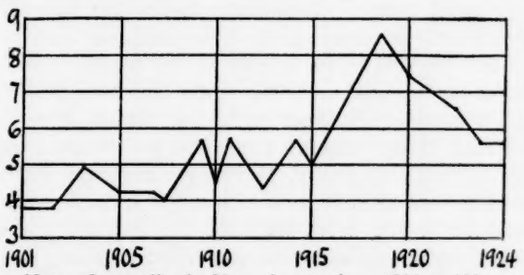
MORTALITY RATES FROM TOXEMIA AND OPERATIVE INTERVENTION

That meddlesome midwifery with its trauma, infection and operative risk adds its quota to the fatalities is beyond question. All statistical studies show that from 30 to 43 per cent of the deaths during pregnancy and childbirth can be credited to infection and that 27 per cent are attributable to the toxemias. None will contend that these are not in large part preventable or that these figures cannot be reduced by surgical cleanliness and proper antenatal, intranatal and postnatal care. That these mortality records can be reduced is shown by a study of the results in teaching clinics in New York and Brooklyn.

At the Berwind Maternity Clinic during the years 1922 to 1926, the maternal mortality was 2.67 per thousand, which includes cases transferred to other institutions. The majority of these women were attended in their homes by students under the supervision of staff obstetricians. In the New York Lying-In Service in 1925, 5,457 women were confined with twenty-two maternal deaths, or a mortality rate of 4 per thousand. At the New York Nursery and Childs Hospital in 1924 there were 2,300 deliveries with a maternal death rate of 9, or 4 per thousand. At the Greenpoint Hospital, one of the teaching units of the Long Island College Hospital, there were in 1928 three deaths in 1,012 deliveries. At St. Catharine's Hospital four mothers were lost in the 1,004 confined; while at the Jewish Hospital, another teaching unit of the Long Island College Hospital, there were only five deaths in 2,293 deliveries, or 2.2 per thousand.

In Brooklyn in the district influenced by our prenatal clinic not only has the mortality in eclampsia been lowered but severe eclampsia is an exception. The incidence of antenatal toxemia, however, is just as high, only the disease is less severe. This we attribute to continuous prenatal propaganda. In other words, while prenatal study with its hygiene and dietetics has prevented the development of an eclamptic explosion, it has done little to reduce the incidence of toxemia produced by the presence of a pregnancy. The average physician still fails to recognize disproportion or to watch for the complications of labor, and failure to appreciate defects in position or the extent of the advance of the presenting part is as common as ever. Surely this defect should and can be corrected by proper training. In obstetric teaching what is called progress has been largely along surgical lines. Some say that obstetrics has become a surgical specialty. To this we cannot subscribe, for the bulk of all deliveries are and always will be conducted by the general practitioner, and it is the clean practitioner who practices aseptically and conservatively who has the lowest morbidity and the smallest mortality.

As we see it, much of the present-day mortality and morbidity is directly the result of the teachings of some prominent obstetricians who have been busy inventing operative procedures to control the onset of labor or shorten or eliminate the second stage of labor or improve the physiologic mechanism of placental delivery. One of these men induces labor in all women at term; another cuts the perineum of every primipara, while still another does a section on every tenth woman and a version on the other nine. Most remarkable of all is the teaching of one of our leading obstetricians who classes all labor as pathologic and advocates rapid delivery with forceps through a cut pelvic floor as soon as the head has passed through the cervix, following this by manual removal of the placenta. It is stated that the routine use of solution of pituitary improves the mechanism of the third stage. The popularity of cesarean section has outgrown all bounds and it is being done for almost every complication of delivery as well as for many of the complicating diseases of pregnancy. Recently we have been advised to do rapid extraction in breech cases as soon as dilatation is complete; while another professor induces labor with bags and advocates digital dilation. Such teaching is bad teaching alike for expert or for novice, and when such advice is put into the hands of the general practitioner by men of reputation of whom he has heard through their publications, and for whom he has the respect that the reader often gives the unseen author, it becomes the underlying factor in maintaining the present relatively high obstetric morbidity and mortality rates.



Maternal mortality in Massachusetts from 1901 to 1924.

To substantiate the statement that operative intervention increases maternal mortality, one need only glance at the maternal mortality rate in Massachusetts as shown in the accompanying chart. The maternal mortality rate in Massachusetts has constantly increased since 1900. In 1901 the number of deaths per thousand live births was 3.8, and in 1905 it was 4.2. In 1910 it rose to 4.8; in 1915 it reached 5.0, and in 1918 the rate was 8.2, but this may be partly explained by the presence of the influenza epidemic. In 1920 the rate came down to 7.5 and in 1924 to 5.8.

In an analysis of 984 maternal deaths (nearly a thousand) death occurred in 225, or 22.5 per cent, from puerperal infection. This includes septicemia, peri-

tonitis, salpingitis, septic endocarditis, streptococcus infection, pyemia and phlebitis. Toxemia caused 217 deaths, or 21.7 per cent. This includes eclampsia, toxic vomiting of pregnancy, acute yellow atrophy of the liver in pregnancy, uremia and the convulsive toxemia of pregnancy. Fourteen per cent, or 140 patients, died of acute infections, including pneumonia, tuberculosis, scarlet fever and erysipelas. Hemorrhage caused 129 deaths in such complications as placenta praevia, premature separation of the placenta, uterine bleeding, bleeding throughout pregnancy and postpartum hemorrhage; of these, about half were antepartum and half postpartum hemorrhages. Ninety-seven patients, or 9.7 per cent, died of embolism; 49.5 per cent died of heart disease. Other causes of death were shock, nephritis, acute dilatation of the heart, intestinal obstruction and ruptured uterus.

From this study of nearly 1,000 maternal deaths, certain observations may be drawn:

1. Septicemia, toxemia and hemorrhage, causes of death which may be classed as generally preventable, were responsible for 58 per cent of the deaths.

2. In 58 per cent of the cases, operative procedures had been resorted to. This factor of operative intervention is of vast importance, even after due allowance has been made for imperative operations. The incidence is many times too high.

When this is contrasted with the maternity record of several Brooklyn institutions, general hospitals with large associate staffs whose members have the privilege of delivering their own patients under the supervision of competent directors, and with teaching institutions in which the deliveries are done by interns and students, under supervision, one finds that while all these hospitals have ambulance services, which necessarily means that many patients have had no prenatal supervision or prenatal study, the morbidity and the mortality is as low as that of the average special maternity hospital or lower, and one-half the mortality that is recorded throughout the greater city. Hence, it must be apparent that much unnecessary operative work is done to expedite delivery.

The fundamental principles in the management of labor should be that the obstetrician observes aseptic practice and aseptic conscience, knows the diagnosis and follows the physiologic mechanism and treats every case as potentially surgical, conserving blood loss and avoiding trauma.

In 2,016 cases attended by interns and students in one of our teaching units, there were 92 per cent of spontaneous deliveries; that is, in 1,859 women delivered without surgical aid there was an operative incidence of 8 per cent. In these 2,000 cases there were seven deaths, which makes a rate of 3.5 per thousand for the series against 6.6, which is the mortality per thousand throughout the state of New York in the same period. In the first thousand there were forty-one stillbirths, in the second twenty-three—these figures including nine premature births in the first group and seven in the second—making a stillbirth incidence of 4.1 and 2.3, respectively, or 3.2 per cent for the entire series, which is only two-fifths the recorded fetal mortality throughout the state.

MORBIDITY

Our present morbidity records are unreliable, for the average institution keeps the maternity patient only ten days. A few services have lengthened the puerperal stay to two weeks, and almost all accept and record as their standard of morbidity a temperature of 100.4 F. on two successive days, not including the first twenty-four hours after delivery. Such a standard without a follow-up can give no adequate index of actual morbidity. We have repeatedly seen a temperature of 100.4 or 101 on one day, or on the third and the eighth day in women who were discharged as afebrile because these temperatures did not occur on two successive days; yet the same women have returned to the hospital with extensive exudates or with pelvic abscesses.

In our clinic we class any case as morbid which shows an elevation of temperature of 100.4 at any time after the first twenty-four hours during the patient's stay in the hospital. Hence, we have a very high uncorrected morbidity; yet such a plan gives us a clean-cut cross-section of what is actually taking place; for instance, the upper respiratory and urinary tracts, the breasts and undetermined causes make up more than 75 per cent of the morbidity in the clinics in and about Greater New York.

In our inpatient service, in all conditions, including ceserean sections, for the years 1924 to 1928 inclusive, the uncorrected morbidity compiled on the American Medical Association standard was, in 1924, 8.44; in 1925, 12.1; in 1926, 15.62; in 1927, 8.9 and in 1928, 7.51, making the average morbidity for the five years 10.52 per cent.

In the outpatient service during the same period, the morbidity was only 3.10, making the rate 6.86 per cent in 5,460 deliveries. However, if we accept as febrile a morbidity based on a single rise in temperature on any day during the puerperium, we find that for all years it is 73.96. We have further studied the relation of morbidity and mortality to previous streptococcic infection, including in this class patients who have given a history of previous streptococcic infection such as scarlet fever, tonsillitis, frequent sore throats, rheumatism, heart disease and previous puerperal infection and, strange as it may seem, these patients present an interesting contrast to those who have not developed any immunity to subsequent streptococcic invasion.

In the first class with a definite history of previous streptococcic infection there were 478 patients with a gross morbidity of 12.24, against 2,400 patients in whom no history of previous infection could be elicited with a percentage of 61.73. On further analysis in the first group, the morbidity attributed to pelvic lesions, such as infection of any of the pelvic tissues, amounted to 2.53; while in the second group the pelvic morbidity was 20.88. It would therefore seem quite evident that patients with a previous history of infection immunize themselves to a considerable degree against subsequent infection. Certainly this is evidenced in the percentage of pelvic lesions as well as in the uncorrected gross morbidity.

Another interesting comparison in this study, which unfortunately has not been worked out to completion, is the relative value of rectal versus vaginal examinations and their relation to the production of morbidity. For the past ten years, in our clinic, rectal examination has been routine. The great majority of all labors are conducted exclusively by rectal touch. As long as the progress is uninterrupted, the position and the condition of the membranes and the cervix can easily be made out. Only when there is arrested progress or doubt as to the actual diagnosis is vaginal examination resorted to. Yet, when we come to compile the morbidities of rectal versus vaginal examination, we find that there is a gross

uncorrected morbidity of 72.07 for rectal examinations as against 75.0 for vaginal. The same percentage obtains when both rectal and vaginal examinations have been used and, odd as it may seem, of the cases in which no examination by either rectum or vagina had been made, the gross uncorrected morbidity is 95.9, which shows how valueless statistics of this type actually are, for in going over in detail the histories of these seventy-five patients in whom no rectal or vaginal examinations were made, we found that all had an upper respiratory infection at the time that they went into labor, and because of this condition, and in the fear of carrying infection into the birth canal, all examinations were omitted.

INCREASE OF MATERNAL RISK THROUGH UNDUE VALUE PLACED ON LIFE OF CHILD

All observers have noticed that prolonged obstructed labor produces cerebral injury that frequently results in fetal death or death of the infant during the first few days of the puerperium. This obstruction need not be a bony one; a rigid cervix or a prolonged second stage will give similiar results. Children delivered after such prolonged labors, whether by forceps or cesarean section, frequently die during the first week following delivery; yet cesarean section is being done repeatedly in just this class in the interest of the child at added risk to the woman. Too many cesarean sections are done without proper indications. Too many are done too late and the indications have been so widened as to include almost every disease that complicates pregnancy. Cesarean section carries with it a greater mortality and morbidity than that of any other clean abdominal operation. The mortality ranges from 1.8 per cent (Holland) in the clean case in which operation has been performed before the beginning of labor to 27 in the cases in which forceps have failed and the membranes have been ruptured for any considerable length of time; while the morbidity ranges from 33 to 70 per cent.

Next to unclean operative intervention, cross-infection is probably the commonest cause of obstetric fever. Almost all the epidemics of late years have been traced to this cause. The recent one at the Sloane Hospital, which was checked by the bacteriologic department of Columbia University, showed that its origin was from the throats of attendants. The obstetrician must remember that the eleven sources of infection are his ten fingers and his throat.

In the study of any mass of mortality or morbidity records, one is impressed with the high incidence of both during the months of February, March and early April, and, just as it was found in 1918 and again in 1926 during the influenza epidemics that the peak of the mortality was reached in these months, so it is true that maternal fatalities occur at this season.

Fetal mortality may be divided into deaths during pregnancy, which include the premature births, viable and nonviable fetuses, and death of the full-term fetus before labor, during labor or as a consequence of labor, and deaths of infants during the period of the mothers' hospitalization.

Premature stillbirths are usually due to placental disease, and this, in turn, is most commonly the result of nephritis and syphilis; yet there is a large class which must always remain in the undetermined group in which for no apparent cause the fetus dies and becomes macerated. The placenta of these children may show no extensive infarcts or, on the other hand, may be made up of widespread areas without circulation. It is in this class that hygiene, diet, antisyphilitic treatment, the administration of thyroid extract and strict sex hygiene may result favorably.

In the full-term group there will always be a number that die before labor for which the obstetrician can in no way be held responsible.

In the Methodist Maternity Service from 1923 to 1928, inclusive, there were 101 full-term babies dead on admission in 7,948 labors against thirty-nine that died during labor in the same number of deliveries. A large proportion of the latter died in the second stage and perhaps could have been saved by routine auscultation of the fetal heart while the head was in the vagina. It is in this class of case that the training of the obstetrician is most apparent. In these 7,948 deliveries there were only nineteen babies that died during delivery.

Breech extraction takes a heavy toll in fetal mortality ranging from 8 to 38 per cent. At the Royal Maternity, Edinburgh, in 100 breech extractions, thirty-eight babies were lost. At the Tsan Yuk, Hong Kong, in thirty-eight breech deliveries eight babies were born dead. In any well conducted service in which there is a prenatal clinic and consecutive attendance of the woman during labor, the fetal mortality should not exceed 4 per cent. In a study of several thousand cases from the best maternity services, the fetal death rate was found to range between 1.9 and 4.8. When infant mortality rises above this average, some omission is to be found in the sequence of management. A high operative incidence always increases the number of intranatal and postnatal deaths. Obstetric accidents, as ablatio 44 per cent, placenta praevia 65 per cent and prolapse of the cord 68 per cent, also contribute to the high fetal mortality, for the chances of the child are not only impaired by the nature of the accident but are further increased by the necessities of operative delivery. Routine autopsy of every fetal death shows that birth trauma and intranatal aspiration of the liquor amnii make up more than 35 per cent of the fatalities.

CONCLUSIONS

From this study of the mortalities and morbidities in this country and in England, the latter taken from the exhaustive reports of Eardlay Holland and James Young, the following conclusions can be drawn:

1. The mortalities directly attributable to childbirth are largely preventable.

2. Intelligent antenatal care which is followed by consecutive hospital attention by the same group of men who have followed the case in the antenatal clinic or in private practice can reduce the fatalities from toxemia, sepsis and from contracted pelves.

3. By increasing the operative incidence in obstetrics, maternal mortalities have been materially raised over what is recognized as the average in well conducted institutions.

4. The present method of recording morbidity is not only inaccurate but unreliable and does not give a true index of the actual results of obstetric care.

5. Prenatal care can and does reduce the incidence of stillbirth but there is a large class of macerated fetuses, premature births and congenital anomalies that so far have not been influenced by antenatal instruction.

6. The woman who has a history of previous streptococcic infection is protected by the development of an immunity against subsequent infections, and is there-

fore less liable to have a morbid course and likewise less liable to die.

7. All the reviewed statistics show that from 90 to 95 per cent of all labors terminate spontaneously and that the higher the incidence of operative intervention, whether done by the expert or by the tyro, the greater the increases in both the maternal and the fetal mortality. Therefore, it may be deduced, first, that childbirth can be made safer by intelligent appreciation of the physiologic mechanism of labor and adherence to strict surgical technic, and, secondly, that in the presence of complicating disease the pregnancy in most instances can be disregarded and attention given to the treatment of the disease.

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FACTORS AND CAUSES OF MATERNAL MORTALITY *

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It has been well known for some time that statistics relative to maternal mortality indicate that the United States is well down the list among the civilized countries. On the whole, it is probable that among these countries statistical comparisons [1] are fairly accurate and do not redound entirely to the credit of the United States (table 1).

In connection with European midwifery particularly, it is well to know that with the greater maturity of these countries an organized system of midwifery has grown up, while in our own country no nation-wide, state-wide, or even city-wide plan of obstetric care has been developed. In most European countries a large percentage of normal deliveries are conducted by carefully trained midwives working with and under the supervision of thoroughly trained obstetric specialists. In some of our cities there has been developed a system of prenatal clinics where physicians are working with public health nurses, and, further, where home deliveries are being conducted by physicians working in conjunction with nurses to furnish home delivery care; but, so far as we know, there is in this country no carefully and well developed system of obstetric care covering any large center of population comparable to that which has been gradually developed in Europe through many generations.

Another factor of importance in this country is that of race. No other country is confronted with an obstetric question that has the magnitude of this one among the negroes. It is true for the registration area as a whole, where the colored and white population live side by side, that the rate among the colored from all puerperal causes as well as from puerperal septicemia is nearly twice as high as among the whites. The actual number of deaths among the colored women is much less than among the white women, there being only one-fifth or one-sixth the number of deaths among the colored as among the whites, a ratio of one negro maternal death to five or six white deaths. This is, however, a sufficiently large number to raise materially the general maternal mortality rate for puerperal septicemia and other puerperal causes. It may be argued that this is due to a large extent to the poorer obstetric care which the negroes receive, but this explanation is not entirely satisfactory because it is stated that in many clinics where both the white and the negro mothers are cared for by the same technic and the same personnel the mortality rate from puerperal causes is still much greater among the colored than among the white women.

Almost none of the countries, especially European, from which comparative statistics have been compiled, have the sparsely settled sections that are found in the United States. This presents a physical problem which makes systematized obstetric care rather more difficult than in most of the European countries.

Statistics for the United States show that the rural rate for maternal mortality is in most sections less than that for the urban communities. Statistically, any city of 10,000 or less is considered as a rural community; those of larger size are considered urban. Doubtless births and deaths are more completely and accurately reported in urban than in rural communities. It is also probable that not infrequently patients whose condition is complicated seek some of the larger centers of population. It may be true that spontaneous abortions are not especially more frequent in cities, but undoubtedly induced abortions are much more frequent in the larger centers of population than in rural sections and these contribute largely to maternal mortality.

Another factor with relation to the comparative rates is that of illegitimacy, which is accompanied by a rather higher mortality than is associated with legitimate pregnancies, doubtless because of the greater incidence of interference with normal processes and the generally poorer care in the former class of patients. This may be a factor in raising the urban rate.

Of considerable importance, also, is the fact that in this country there are relatively few institutions which are devoted exclusively to the care of maternity cases and which are staffed by a personnel that has been thoroughly trained in obstetric practices.

In this country, particularly in general hospitals, a tendency to resort frequently to surgical procedures to assist or complete the delivery of the child has been developed. This surgical intervention, often not indicated, is necessarily associated with a higher morbidity and mortality among both mothers and infants.

Another factor of great importance in raising the maternal mortality rate is the frequency of deaths following the early termination of pregnancy, in which there is an especially high rate of death from infection. In some communities, deaths following the premature termination of pregnancy average between 30 and 40 per cent of the total number of maternal deaths. Plural births are more dangerous and are more commonly associated with operative deliveries.

The age factor has some relationship to maternal mortality. The most favorable age for the mother, so far as life is concerned, is the decade from 20 to 30 years. Prior to 20 the mortality rate is somewhat higher, presumably because of a relatively higher percentage of illegitimate pregnancies. After 30 the rate progressively increases with each decade of life.

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* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

1. Woodbury, R. M.: Maternal Mortality: The Risk of Death in Childbirth and from All Diseases Caused by Pregnancy and Confinement, publication 158, Children's Bureau, U. S. Department of Labor, 1926.

The factor of multiparity is perhaps of some importance but probably only indirectly so. The first labor is the one carrying the greatest risk, while the second and third labors are the least hazardous.

The factor of education and training is one of tremendous importance in the practice of medicine in general and obstetrics in particular. There are many who practice obstetrics casually or regularly who would not think of performing even a surgical operation except in dire emergency.

Many confinements in the United States are conducted by improperly trained attendants whose education and training are not comparable with that of the European midwives and physicians practicing obstetrics. There is no adequate training for midwives in this country. J. W. Williams [2] outlined some fundamentals a number of years ago, which conditions have not yet been met by many medical schools. Recently lessened resistance to infection than was formerly the case. Other factors which have in part been already mentioned may also enter into this. The protection from diseases of childhood may mean less acquired immunity for later life.

The sources of infection in connection with childbearing may be considered as endogenous and exogenous. Endogenous infection may be largely ignored. Practically all puerperal infections may be regarded as contact infections and therefore as contagion.

Many statistics have been quoted to show that well trained midwives in Europe report fewer deaths from puerperal septicemia than do physicians. It would seem apparent that the reason for this is that the midwife usually cares only for obstetric patients whereas the physician in his daily work cares for many infectious cases; hence the possibility is much greater that he may carry infection to a parturient patient by way

TABLE 1.—*Maternal Mortality Rates for the United States and Certain Foreign Countries per 10,000 Live Births*

Country	All Causes													Puerperal Septicemia						
	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1921	1922	1923	1924	1925	1926	1927
Australia	48	53	56	47	47	50	47	45	51	55	56	53	..	15	14	17	20	17	16	..
Belgium	..	..	..	..	72	60	57	53	56	58	50	..	..	24	21	29	31	28	..	..
Canada	..	..	..	..	..	..	51	55	54	60	56	57	..	11	11	18	17	17	..	..
Chile	66	73	72	82	88	75	79	89	74	61	61	58	..	24	22	19	13	15	16	..
Czechoslovakia	..	..	..	..	..	..	..	..	33	31	33	31	..	..	12	15	12	14	13	..
Denmark	..	..	..	..	..	24	20	20	23	23	24	23	..	13	9	10	9	9	11	..
England and Wales	42	41	39	58	44	43	39	38	38	37	41	41	41	14	14	13	14	16	16	..
Finland	34	36	38	41	40	36	33	30	31	35	29	..	..	..	..	..	..	..	..	..
Germany	40	45	45	49	51	49	49	50	52	53	50	49	..	22	28	30	29	26	..	..
Hungary	..	..	..	..	..	32	29	30	28	31	29	32	..	12	13	13	15	14	16	..
Irish Free State	..	..	..	..	..	..	..	57	48	48	47	49	..	..	..	19	16	17	..	..
Italy	22	27	30	37	29	23	23	25	27	32	28	..	..	..	..	..	..	..	..	..
Japan	36	35	35	38	33	35	36	33	34	31	30	27	..	15	12	13	13	10	..	..
Netherlands	25	26	25	30	34	24	23	25	23	24	26	29	..	7	7	6	7	9	..	..
New Zealand	47	59	60	52	51	65	51	51	51	50	47	52	..	17	18	19	19	15	14	..
North Ireland	..	..	..	..	..	..	..	47	49	45	44	56	48	..	19	16	15	16	..	..
Norway	27	28	30	30	35	26	22	25	28	29	27	..	..	8	7	7	6	..	..	..
Salvador	..	..	..	..	..	..	57	46	50	57	50	55	62	10	11	10	8	9	..	..
Scotland	61	57	59	70	62	62	64	66	64	58	62	64	64	26	20	19	17	16	17	..
Spain	52	52	51	64	53	50	51	49	46	44	..	..	..	32	32	28	27	..	..	..
Sweden	29	27	25	26	32	27	27	25	23	..	..	..	..	13	11	..	..	..	..	..
Switzerland	..	..	..	..	..	..	55	51	46	48	43	44	..	31	25	22	16	20	20	..
United States birth registration area	61	62	60	92	74	80	68	66	67	66	65	63	65	27	24	25	24	24	24	25
Uruguay	22	29	32	30	23	34	33	27	27	25	25	30	..	19	16	17	16	15	..	..

Palmer Findley,[3] after conducting a thorough inquiry into conditions existing in this country as well as in foreign countries, expressed among other conclusions the following:

> Everywhere throughout the world it is apparent that the teaching of obstetrics is receiving more and more consideration. The medical schools of the United States are lagging far behind most schools of the world in practical instruction and this for lack of adequate clinical facilities and the time to devote to it. There must be a revamping of the entire curricula in our schools to the end that our students may be better prepared to meet the demands of the general practice of medicine.
>
> The maternal morbidity and mortality, which in the United States has not decreased in the last fifteen years and is today the highest of the twenty-two leading nations, is chargeable to educational defects and will not be materially reduced until our institutions provide more adequate clinical facilities.

The economic factor is also of importance but will not be considered here.

CAUSES OF MATERNAL MORTALITY

So far as the causes of maternal mortality are concerned, puerperal infection stands first. The maternal mortality rate from puerperal septicemia has not materially declined for many years past, not only in this country but in foreign countries as well. There may be more women in the child-bearing period who have of his hands or clothes than that the uncontaminated midwife would carry such infection. A midwife who has a patient with puerperal septicemia is apt to convey this infection to other patients, even though she carefully washes her hands. The physician may do the same thing, but he may also carry a virulent organism from a case of erysipelas, scarlet fever, septic throat or puerperal infection. The use of rubber gloves and other necessary precautions would reduce the incidence of contact infection for both the midwife and the physician.

Another factor of great importance in the dissemination of puerperal sepsis is the occurrence of widespread infection of the upper respiratory tract which may be due to streptococci. It is easy for the physician, midwife, nurse or other attendant to carry infectious material on the hands from his or her own nose or throat to the genitalia or breasts of the parturient woman unless proper precautions are used, of which the most important, in addition to thorough scrubbing of the hands, is the use of the protecting and sterile rubber glove. A face mask also to protect against carriers is important.

Trauma in relation to infection is of great importance and is regarded by some as paramount. It seems reasonable to consider it as a contributory cause of the first order. There appears to be no definite relationship between the extent of the trauma and the severity of the infection.

2. Williams, J. W.: Medical Education and the Midwife Problem in the United States, J. A. M. A. **58**: 1-7 (Jan. 6) 1912.

3. Findley, Palmer: Teaching of Obstetrics, Am. J. Obst. & Gynec. **16**: 611 (Nov.) 1928.

One must remember that trauma is incidental to and associated with every labor; the placental site is always present, and slight or extensive lacerations of the cervix, vagina and vulva are so common as to be almost general and afford the possibility of an atrium of infection in every case.

Trauma should be classified as that associated with physiologic or natural labor and that which accompanies pathologic and artificial labor. Disregarding the occasional case of endogenous infection, one must consider the two essential factors in the introduction of puerperal infection to be trauma and contact or contagion. When infection is introduced by the operation of these factors, one has to rely on a third factor that has an important bearing on the course of the infection, namely, the resistance of the parturient woman to a given infection; in other words, the degree of immunity, whether natural or acquired, which a woman has to a particular infection.

Infection is influenced chiefly by the kind of intrapartum care which the mother receives either in the hospital or in the home. The better the institution and the personnel, the lower will be the rate, if other things are equal. The septic deaths are directly influenced but little by the factor of antepartum care but indirectly to a considerable extent in the way of securing adequate preparation prior to the actual confinement.

Antepartum care would have a much greater effect on the mortality rate from toxemia, and this would seem to be shown or at least indicated in the slightly downward trend of the mortality rate from puerperal albuminuria and convulsion. Greater stress has been placed on antepartum care of late years and the mortality rates from toxemia would seem to show a beneficial effect during the past five years. During the period from 1922 to 1927 inclusive, and for each year, the death rates from puerperal albuminuria and convulsions were 17.6, 16.1, 16.8, 16.8, 16.3, and 14.9 per thousand.

Table 2.—*Maternal Mortality Rates per 10,000 Live Births in United States Registration Area*

Causes of Death	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
Accidents of pregnancy	5.1	5.0	5.4	22.2	10.7	11.5	5.7	6.5	6.9	6.0	5.8	6.9	5.9
Puerperal hemorrhage	6.2	6.4	6.5	6.3	6.2	7.0	7.3	6.6	6.6	6.7	6.6	7.1	6.8
Other accidents of labor	6.1	6.4	6.2	16.6	10.7	11.2	7.0	8.0	7.9	7.1	7.2	7.5	7.2
Puerperal septicemia	23.9	25.2	27.4	25.5	24.5	26.7	27.1	23.9	25.1	24.4	24.3	24.2	25.0
Puerperal albuminuria and convulsions	16.4	16.4	17.8	18.3	18.4	20.2	18.0	18.1	16.5	17.8	17.3	16.7	16.6
Total for U. S. registration area	60.8	62.2	66.2	91.6	73.7	79.9	68.2	66.4	66.5	65.6	64.7	65.6	64.7
Urban rate plus 10,000	64.1	65.1	70.0	96.0	78.8	85.6	77.1	73.2	73.8	73.5	73.5	73.9	74.8
Rural rate plus 10,000	55.3	57.3	62.3	87.2	68.8	74.1	59.4	59.5	58.7	57.6	55.5	56.7	55.3
White rate	60.1	60.8	63.2	88.9	69.6	76.0	64.4	62.8	62.6	60.7	60.3	61.9	59.4
Colored rate	105.6	117.9	117.7	139.3	121.4	128.1	107.7	106.8	109.5	117.9	116.2	107.1	113.3

ANALYSIS OF PUERPERAL DEATHS IN TWELVE STATES DURING 1927.

As the result of a study made possible through the cooperation and courtesy of the Children's Bureau of the Department of Labor, Washington, D. C., we are able to give some of the preliminary data that have been secured from the investigation, which has been conducted in a number of the states. This work has been carried on with the assistance of various state medical associations through the state boards of health and consisted of personal interviews with physicians who reported maternal deaths. Some of the data have been tabulated, and we shall give here some information relative to all puerperal deaths during 1927 for twelve states; namely, New Hampshire, Rhode Island, Maryland, Virginia, Kentucky, Michigan, Wisconsin, Minnesota, North Dakota, Nebraska, Washington and Oregon. The cases are classified according to the eight groups of causes used by the United States Bureau of Census and recognized in the International List of Causes of Death.

This study covers 2,697 cases which were classified from the death certificates as puerperal deaths. After an interview with the physicians, forty-seven were grouped as nonpuerperal, leaving 2,650 puerperal deaths for analysis. There were also some rearrangements in classification, after the securing of further information regarding these cases, which led to an increase in the number of deaths from septicemia and a reduction in the number of toxemias. Among the 2,650 cases there were five causes which aggregated over 200 cases each, and the figures for these five principal causes were: septicemia, 1,076, or 41 per cent; toxemia, 612, or 23 per cent; puerperal hemorrhage, 300, or 11 per cent; accidents of pregnancy, 281, or 10 per cent; other accidents of labor, 221, or 8 per cent.

Prenatal Care.—This factor is of great importance and will be given especial attention.

For the purposes of classification, the prenatal care which these patients received is divided into grades. Certain groups of cases—the self-induced and criminal abortions, and those in which pregnancy terminated before the third month—are excluded from the group for which prenatal care is studied. The others are classified as follows:

Grade I: Those who had prenatal care nearly as described in Standards of Prenatal Care, publication 153 of the Children's Bureau.

Grade II: Those who had, first, a general physical examination, including examination of heart, lungs and abdomen; and, second, regular monthly visits to a physician, beginning not later than the seventh month, with examination of the urine and blood pressure determinations at each visit.

Grade III: Those who had some prenatal care, but not care meeting the requirements of grade II. Such care may have consisted of only a single visit.

Of the 2,650 women who died, there was a report regarding prenatal care in 1,982. Of these, 956 received no care and 1,026 received some. There were only 286 who received any adequate prenatal care, which is 11 per cent of the whole series, 14 + per cent of those in whom a report was made, and 28 per cent of those who received some prenatal care.

Toxemia of pregnancy caused death in 235 (25 per cent) of the 956 patients without prenatal care, and in 322 (31 + per cent) of the 1,026 patients with some prenatal care.

Septicemia caused death in 373 (40 per cent) of those without such care and in 273 (26 + per cent) with some prenatal care. Deaths from puerperal

hemorrhage were relatively less frequent in those receiving such care. The accidents of pregnancy occurred in a higher percentage of those not having prenatal care.

Cesarean sections were more frequent in the prenatal group, but other obstetric operations occurred more often in the other series. This might mean a more intelligent selection of the appropriate operative procedure in the prenatal group.

On the whole, this analysis does not give any conclusive evidence of the value of prenatal care. It indicates only that in most of the fatal cases very inadequate care was given, which might be cited as an argument that more lives might have been saved by such care.

The period of gestation in relation to the time of death is important, and of the 2,650 patients, 65.4 per cent, or 1,732, had passed the seventh month of gestation, which leaves 909 (34.3 per cent) under the seventh month. Of those under seven months, 672 (25.4 per cent) of the total died of abortions. Of the 672 abortions, 583 were reported, with 186 spontaneous; sixty-nine therapeutic, and 328 induced, leaving eighty-nine in which the type was not reported. With reference to the marital status, it is interesting to note that sixty women were single and 610 married.

Age Factor.—It is of interest that 304 of the 672 deaths from abortion occurred between the ages of 20 and 29 and 259 of the fatalities took place between the ages of 30 and 39.

Among those dying from induced abortions the parity was stated in 274, and of these 205 were multiparas, or about 75 per cent. Among 163 with spontaneous abortions, 134 were multiparas, or about 82 per cent.

Race.—It was found that, of the 672 deaths, 604 occurred among the white women with a rate of 14.0, and sixty-eight among the colored with a rate of 19.9 per 10,000 live births. The death rate for induced abortion is almost the same for the two races but is considerably higher for spontaneous abortion among the negroes than the whites, the relative rates being 7.9 and 3.7.

Of the 672 cases of premature termination of pregnancy, 176 occurred under three months, of which thirty-four were spontaneous, five therapeutic and 137 induced. About 77 per cent of those under three months were induced, and a small percentage were therapeutic, while from the third to the seventh month nearly 39 per cent were induced, and about 20 per cent were therapeutic.

Of 672 patients, 498 dying prior to the seventh month of gestation died from septicemia, which is about 74 per cent. Only four patients died from hemorrhage. Of 328 induced abortions, death occurred in 293, or nearly 90 per cent, from puerperal septicemia, while in 112 of the 186 spontaneous cases, or about 60 per cent, death was caused by sepsis.

Operative procedures were carried out in 375 of the 672 abortions, or 55 per cent. Curettage, either alone or in combination with other operations, was done in 230 instances, or 34 per cent, not including sixty-nine cases of therapeutic abortion.

As already stated, about 74 per cent of these 672 patients died from septicemia. Of the 258 in whom curettage was done, 207 died from septicemia, or about 80 per cent. Some of these 180 had fever before curettage, and 172 of these (95 per cent) died of septicemia. In seventy-eight no fever was reported prior to curettage and thirty-five (45 per cent) of these died from sepsis. Of 373 without curettage, 263 died from septicemia, which is a percentage of about 70. Some of these had other intra-uterine manipulations, but there were 322 with no history of postpartum manipulations, and 219 of these (68 per cent) died of puerperal sepsis.

This seems to point to a lesser septic mortality in those cases without postpartum intra-uterine manipulation, especially curettage. This is especially striking in the comparison of the groups in which curettage was done prior to, or subsequent to, the development of fever, and points to the danger of septic deaths in those patients who are infected prior to the intra-uterine manipulation.

A tabulation of the 2,650 cases with reference to the period of gestation and frequency of operative procedures shows 2,591 cases in which there is a report regarding an operation. Of these patients, 1,732 (65 per cent) died during the seventh month or later, and 909 (35 per cent) succumbed prior to this period. Death was preceded by an operation in 1,454 (56 per cent) and not so preceded in 1,137 (44 per cent). Of the 1,703 reported with reference to an operation and dying during or after the seventh month, 966 (56 per cent) had some operation and 737 (44 per cent) had none. The 886 dying prior to the seventh month are reported to have had operations in 488 instances (55 per cent) and to have had none in 397 (45 per cent) instances.

The principal causes of death in these 1,732 cases of seven and more months' gestation were septicemia, 541 (31 per cent); albuminuria and convulsions, 487 (28 per cent); puerperal hemorrhage, 291 (17 per cent); other accidents of labor, 134 (8 per cent); phlegmasia alba dolens, 123 (7 per cent); accidents of pregnancy, fifty-eight (3 per cent); cesarean section, fifty-two (3 per cent), and other surgical operations and instrumental deliveries, thirty-three (2 per cent).

Onset of Labor.—In all except seventy-nine of the 2,650 reports, a statement was given regarding the onset of labor.

Of 1,662 patients beyond the seventh month period, 1,302 had a spontaneous onset and 263 (16 per cent) an artificial onset, which in all except thirteen or fourteen was an operative induction.

The principal causes of death in the 1,302 cases of spontaneous onset were puerperal sepsis, 484 (37 per cent); toxemia, 263 (20 per cent); puerperal hemorrhage, 205 (15 per cent); phlegmasia alba dolens, embolism, and other conditions, 116 (8 per cent); and other accidents of labor, 127 (9 per cent).

In the 263 with an artificial onset of labor, toxemia was the most frequent cause of death (139 cases, or 53 per cent); puerperal hemorrhage occurred in fifty-six instances (21 per cent), and septicemia in thirty-six (13 per cent). Cesarean section was given as the cause of death in eighteen, or about 7 per cent. The probable reason for the smaller percentage of deaths from sepsis is that many women died from toxemia before septicemia had an opportunity to develop.

The operations other than obstetric do not give much information of value.

Obstetric Operations.—There were 1,693 patients beyond seven months' gestation for whom there were reports regarding obstetric operations. Of these, 850 (50 per cent) had no such operation and 843 (49 per cent) had some operative obstetric procedure; of the latter, 226 (27 per cent) gave a history of having had

one or more of the following conditions: placenta praevia, premature separation of the placenta, ruptured or inverted uterus, and transverse presentation.

The most frequent type of operation was forceps delivery, which was performed in 197, or 12 per cent, of the 1,693 cases and in 23 per cent of the 843 patients who had had obstetric operations. The causes of death in the forceps deliveries were sepsis in sixty-four (32 per cent); albuminuria and convulsions in fifty-two (26 per cent); hemorrhage in twenty-six (13 per cent), and other accidents of labor in twenty

TABLE 3.—*Minneapolis Infant Welfare Society Comparison of Maternal Mortality Statistics for Four Year Period 1925-1928* *

Total number of living births	35,583	
Total number of stillbirths	1,355	
Total number of recorded births	36,938	
Percentage of stillbirths in recorded births		3.6 %
Total number of maternal deaths	216	
Maternal mortality rate per thousand living births		6.07%
Maternal mortality rate per thousand recorded births		5.8 %
Total number of maternal deaths over 5 months' gestation	140	
Maternal mortality rate over 5 months' gestation per thousand living births		3.9 %
Maternal mortality rate over 5 months' gestation per thousand recorded births		3.7 %
Stillbirths associated with maternal deaths	44	(20.4%)
Maternal deaths with mother undelivered	16	(4.6%)

* The Minnesota law requires registration of births at 5 months' gestation.

(10 per cent). There is a relatively large percentage of cesarean sections, the operation having been done in 155, or 9 per cent, of the 1,693 cases and in 18 per cent of the 843 in which there had been obstetric operations. The causes of death were toxemia in fifty-nine (38 per cent), the operation itself in thirty-nine (25 per cent), septicemia in thirty-eight (25 per cent), and hemorrhage in sixteen (10 per cent).

The fatalities with podalic version were eighty-two, which is 5 per cent of the total reported cases and nearly 10 per cent of the operative group. Hemorrhage caused twenty-eight (34 per cent) of these deaths; septicemia twenty-three (28 per cent), and toxemia thirteen (16 per cent).

There were quite a few cases in which a combination of operations was performed, the most frequent being podalic version, which was done in association with other operations 163 times, or in 19 per cent of the cases in which operations were done. Most of these 121 operations were done in combination with mechanical dilation of the cervix. Forceps delivery was combined with other operations in 102 cases; sixty-four of these were done in conjunction with mechanical dilation of the cervix. Cesarean section was done in combination with other operations in twenty-six instances, and embryotomy twenty-three times. The number of combined operations was 302, which is 35 per cent of the total of 843 operations. The principal cause of death was toxemia, in ninety-five cases (31 per cent), and in eighty-one (89 per cent) of these mechanical dilation of the cervix was combined with either version or forceps delivery. Hemorrhage was the next most frequent cause, accounting for ninety-one (30 per cent) of the deaths. In deaths from hemorrhage it is not unlikely that the trauma associated with forcible dilation of the cervix and extraction contributed definitely to the mortality.

Fourteen (60 per cent) of the twenty-three patients in whom a combined embryotomy was performed died from sepsis. Ten of these with a cesarean section combination died from sepsis, and thirteen deaths were attributed to the operation itself; 90 per cent of these patients died from sepsis or the operation. In the group in which only cesarean section was done, about 50 per cent died from these causes.

Termination of Labor.—There were in all 1,682 women beyond the stage of seven months' gestation. Of these, 799 had a spontaneous and 727 an artificial termination.

The causes of death in the whole group were sepsis, 519 (31 per cent); toxemia, 475 (28 per cent); hemorrhage, 284 (28 per cent); accidents of labor, 130 (8 per cent), and phlegmasia alba dolens, 122 (7 per cent). With spontaneous termination of labor 324 (40 per cent) died of septicemia; 171 (21 per cent) of albuminuria and convulsions; 104 (13 per cent) from hemorrhage; eighty-nine (10 + per cent) from phlegmasia alba dolens, and seventy-six (10 — per cent) from other accidents of labor. Of the 727 cases in which there was artificial termination of labor, there were 213 deaths (29 per cent) from septicemia; 159 (22 per cent) from puerperal hemorrhage; eighty-one (11 per cent) from cesarean section and other operations; thirty-nine (5 per cent) from accidents of labor, and thirty (4 per cent) from phlegmasia alba dolens.

The rate for septicemia is higher among those delivered spontaneously than for the patients delivered artificially, but deaths from toxemia and hemorrhage are more frequent among those delivered artificially. These causes produced fatalities before sepsis had an opportunity to cause death.

The age factor may be bound up with others of greater importance. The data show a higher mortality rate (48.8) under 20 years than during the ages of 20 to 24 (39.9), and about the same (48.7) as for the period from 25 to 29. There is a progressive

TABLE 4.—*Minneapolis Infant Welfare Society Summary of Maternal Mortality Statistics for Four Year Period 1925-1928*

Total maternal deaths	216		
Total maternal deaths under 5 months' gestation	76		35%
Total maternal deaths over 5 months' gestation	140		65%
Total maternal deaths	216		
Total maternal deaths classified in code 146	81		38%
Under 5 months' gestation	43	53%	
Over 5 months' gestation	38	47%	
Total maternal deaths classified in code 148	52		24%
Under 5 months' gestation	12	23%	
Over 5 months' gestation	40	77%	
Total maternal deaths under 5 months' gestation	76		
Classified in code 146	43	57%	
Classified in code 148	12	16%	
Total maternal deaths over 5 months' gestation	140		
Classified in code 146	38	27%	
Classified in code 148	40	28.5%	

increase for each five year period to the highest rate of 116.5 for 40 years and over.

The place of death with reference to the period of gestation is important, but is more accurate if the data are also based on the place of birth.

It is not difficult to understand why the maternal mortality rates for hospitals are higher than those for the home; 66 per cent of the deaths associated with complications leading to premature termination of pregnancy occurred in hospitals. About 75 per cent of patients with abortions died in these institutions.

Relatively few delivered in hospitals died outside, while 21 + per cent delivered outside were taken to hospitals, where they died. A further point of great significance is that 46 per cent of the patients subsequently dying who were delivered in hospitals were taken there for delivery as an emergency.

STUDY OF MATERNAL MORTALITY IN MINNEAPOLIS

We have made a study in Minneapolis of 216 maternal deaths occurring during the four year period 1925-1928. This work was done by the Infant Welfare Society with the cooperation of Miss Helen C. Peck.

It is most striking and important that the maternal mortality rate per thousand living births is 6.07, but if the rate is figured for those pregnancies which terminated after the fifth month of gestation, the rate is 3.9 (table 3). Thirty-five per cent of the puerperal deaths took place under five months' gestation; 53 per cent of the deaths from puerperal septicemia occurred under the fifth month, and 57 per cent of all the deaths under this period were from sepsis.

Only 23 per cent of deaths from toxemias occurred under five months, and 16 per cent of all deaths under five months were from toxemia (table 4).

TABLE 5.—*Minneapolis Infant Welfare Society Comparison of Maternal Mortality Statistics by Causes for Four Year Period 1925-1928*

Causes	Code	Under Five Months' Gestation		Over Five Months' Gestation		Total	
		No.	%	No.	%	No.	%
Septicemia	146	43	20	38	18	81	38
Toxemia	148	12	5.5	40	18.5	52	24
Hemorrhage	144	3	2	18	8	21	10
Accidents of pregnancy	143	17	8	4	2	21	10
Embolism	147	1	0.004	17	7.8	18	8
Accidents of labor	145	0	0	18	8	18	8
Not defined	149	0	0	5	2	5	2
Total		76	35.504	140	64.3	216	100

Thirty-eight per cent of the fatalities were from septicemia and more than half occurred prior to five months. The toxemias were responsible for 24 per cent, most of them occurring after the fifth month (table 5).

About 57 per cent of the women dying under five death, in hospitals especially it is worth while to note of those who die after this period do so from infection, and about an equal number succumb to toxemia.

If only cases are considered which terminate after the fifth month, the mortality rates are practically the same for the home and the hospital deliveries. Similar groups were compared over a three year period and it was found that the rate for sepsis for home deliveries was 1.6 and that for hospitals of the city 0.88, which indicates that deaths from infection are less frequent for patients delivered in the hospitals (table 7).

Miss N. B. Willey of the Minneapolis Visiting Nurse Association has made a statistical analysis of some of the cases in which nursing care was given. During a four year period the association has cared for 3,882 cases, with nine deaths. This gives a rate of 2.3, as compared with 5.8 for the city at large. This shows what may be done by cooperation between physicians and nurses in giving maternity care.

With reference to the frequency of abortions causing death, in hospitals especially, it is worth while to note that during the five year period from 1923 to 1927, at the Minneapolis General Hospital, there were 5,911 deliveries with thirty maternal deaths, a rate of 5.1; thirteen of the patients died from sepsis, a rate of 2.3 per thousand. During the same period 1,272 patients with abortions were treated in the wards of the hospital, with twenty-six deaths, of which all but one were from some form of infection, genital in twenty-two and extragenital in three.

SUMMARY AND CONCLUSIONS

1. The maternal mortality rate of the United States is not one of which we can be proud.

TABLE 6.—*Minneapolis Infant Welfare Society Analysis of One Hundred and Forty Maternal Deaths Over Five Months' Gestation Following Home and Hospital Deliveries During 1925, 1926, 1927 and 1928*

Year	Living Births	Home Deliveries		Deaths Following Home Deliveries		Hospital Deliveries		Deaths Following Hospital Deliveries	
		No.	%	No.	Rate per 1,000	No.	%	No.	Rate per 1,000
1925	9,423	2,585	28	8	3.1	6,838	72	24	3.5
1926	9,192	2,265	25	7	3.0	6,927	75	38	5.6
1927	8,620	1,983	23	5	2.5	6,637	77	17	2.5
1928	8,348	1,787	21.5	9	5.0	6,561	78.5	25	3.8
Total	35,583	8,620	24.2	29*	3.4	26,963	75.8	104†	3.9

* One died at home undelivered.
† Six died at hospital undelivered.

2. There are certain problems, not insurmountable, which confront us for solution before this rate can be materially reduced.

3. The most important factor is the provision of suitable institutions and of a well trained personnel to provide proper care for mothers during pregnancy, labor and the puerperium.

4. The question of physician, midwife or nurse is not so essential as the character and training of the individual attendants.

5. It does not especially matter whether obstetric care is urban or rural, at home or in the hospital, as good care can be provided under all these conditions.

TABLE 7.—*Minneapolis Infant Welfare Society Summary of Rates per Thousand Deliveries at Home and Hospital by Causes Over Five Months' Gestation*

Year	Deaths Due to Septicemia (146) Following Delivery at				Deaths Due to Toxemias (148) Following Delivery at				Deaths Due to Hemorrhage (144) Following Delivery at			
	Home		Hospital		Home		Hospital		Home		Hospital	
	No.	Rate per 1,000	No.	Rate per 1,000	No.	Rate per 1,000	No.	Rate per 1,000	No.	Rate per 1,000	No.	Rate per 1,0000
1925	5	1.9	2	0.3	2	0.8	5	0.7	0	...	3	0.4
1926	2	0.9	10	1.4	3	1.3	11	1.5	0	...	3	0.4
1927	4	2.0	5	0.7	1	0.5	3	1.1	0	...	4	0.6
1928	6	3.4	3	0.4	2	1.1	9	1.4	0	...	6	0.9
Total	17	2.0	20	0.74	8	0.93	28	1.0	0	...	16	0.59

6. It is still necessary to educate laymen to the dangers of abortions, toxemias and infections, and they must further realize the importance of good care during pregnancy, labor and the puerperium.

7. It is also necessary for those now practicing obstetrics to give a good account of the "talent" entrusted to them.

8. It is most important to make proper and adequate provision for the necessary and suitable training of those who are to practice obstetrics in the future.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. POLAK AND DRS. HOLMES, MUSSEY AND ADAIR

DR. ALBERT W. HOLMAN, Portland, Ore.: After careful study Dr. Polak has given the following causes which contribute to the high maternal mortality and morbidity, and which I repeat for the sake of emphasis: (1) lack of prenatal care; (2) lack of aseptic practice and conscience; (3) too much interference with normal labor; (4) unnecessary cesarean section; (5) undue value placed on the child's life; (6) cross infection, and (7) hurrying labor by the use of solution of pituitary. There is not one of these causes that is not to be laid entirely at the door of the attending physician, and not one that is not in great part avoidable. As has been stated, much of the maternal mortality and morbidity is attributable to the teachings of various radical writers who advocate this procedure or that, but we must bear in mind that in the hands of the men who have used these methods in large series of cases the results are probably relatively good. Is not by far the greater blame for these figures squarely on the general practitioners who deliver the majority of women in America and is it not due to their inability to discriminate between the procedure or intervention which is physiologically sound and that which is not? It would seem that the high maternal mortality in America is due to a general lack of discrimination on the part of those who deal with pregnant women. Does not the solution of this problem lie in better fundamental obstetric teaching, more postgraduate work in obstetrics by the general practitioner, and greater attendance at meetings where such papers as these we have just heard are read? In ranting at the proponents of these so-called unnatural methods we are perhaps wasting time which might better be spent in efforts to raise the general level of information with regard to the basic principles of anatomy, physiology and bacteriology, thus creating a general critical faculty which will allow the individual to distinguish between methods good and bad that will prevent the wide acceptance of operative procedures in conflict with sound judgment and obstetric principles.

DR. CARL HENRY DAVIS, Milwaukee: Dr. Holman has emphasized again a point which I tried to bring out in a previous discussion that, after all, our medical schools must recognize their responsibility in this high mortality rate. Improved obstetrics will follow more adequate training of medical students.

DR. KARL H. MARTZLOFF, Portland, Ore.: Dr. Polak has again called attention to the rôle of streptococcus infection as the major cause of mortality in obstetrics. From the point of view of the gynecologist, it seems remarkable, when one considers the work of Stieve, that more fatalities from infection do not occur. Stieve, in a most excellent study, has shown that with the onset of labor, as the membranes pass down the cervical canal, the mucous plug and the cervical glands, except for some small epithelial remains, are wiped away, leaving a raw surface open to any pathogenic organisms that may be present. Streptococci in the female genital tract are of importance in at least two other conditions aside from those of pregnancy and its infectious complications. The first of these concerns itself with the presence of streptococci in some cases of chronic endocervicitis. It is most unusual to find recognizable streptococci in direct smears from the cervix uteri. When present they occur, as Dr. Arthur Curtis and other workers have shown, in the form of gram-positive or gram-negative diplococci which only on culture asume their arrangement in chains. The unsuspected presence of virulent streptococci therefore occasionally converts the so-called simple dilation and curettage into a veritable maelstrom for the gynecologic mariner. The second condition concerns itself with the presence of streptococci in cancer of the cervix uteri. In some clinics 95 per cent of the mortalities following operation for cancer of the cervix are reported as due to a streptococcus peritonitis. In the Johns Hopkins series reported from Dr. Cullen's clinic several years ago, infection was next to the most frequent cause of postoperative mortality in patients with cancer of the cervix uteri. Virulent streptococci are also the source of some of the serious complications in patients with cancer treated with radium. The question naturally arises whether one can detect before labor or operation those instances in which virulent streptococci are present. For this purpose, Philipp in Bumm's clinic has tried the so-called virulence test in patients with cancer of the cervix uteri. He has shown that patients harboring virulent streptococci almost without exception experience stormy convalescences and a high proportion of deaths. On the other hand, those with avirulent streptococci enjoy, almost uniformly, smooth postoperative recoveries. I should like to ask Dr. Polak's opinion concerning the value of Philipp's procedure in obstetrics.

DR. FRANK W. LYNCH, San Francisco: These papers have emphasized two important points: the possibility of great advances in the physiology of woman, and the value of efficiency studies in the conduct of our practice. As physicians we must be stimulated to scientific thinking, and at the same time we must make our living by cold blooded judgment. Nobody could hear these papers without being impressed with the fact that women who are pregnant are not good surgical risks. We cannot alter the physiology of labor. Women have been having babies for quite a few years, and the quicker we realize that there is something inherent in the human female that prohibits the uterus from being invaded with impunity, the more patients will be cured and saved with a consequent prevention of serious complications. Women having babies are in their youth, and youth is kind. We can do all sorts of things to young people almost with impunity unless they are pregnant. The one thing we do know in the physiology of pregnancy is that we are not cutting through normal tissue. A uterus is involuting even while one is cutting, and it will never heal in the same way that muscle of the general body does. So, if we are going to do anything to reduce the incidence of death in young women, it is going to come only from observing common sense. Students in medical schools must be given much clinical experience in obstetrics—not ten or fifteen cases. The day will come when anybody going into practice should have cared for a minimum of 100 cases before he may dare take the responsibility of caring for a pregnant woman. In surgery everything a man does enriches his experience if he thinks of what he is doing, but if a man has 1,000 obstetric cases, a case a week for twenty years, what does he get in his experience? If he is sensible, he gets 10 or 15 per cent of operative work—100 or 115 operations in twenty years of his life—of which the majority are simple low forceps or breech extractions, and he does not know that obstetric experience is the most difficult thing to get in the art of medicine.

DR. C. E. MONGAN, Somerville, Mass.: The Massachusetts Medical Society through its section of obstetrics and gynecology is making a survey of the incidence of puerperal septicemia over a period of five years. Already two years of the survey have been completed. We are working continually for the purpose of reaching and securing the confidence of the general practitioner without whose aid we feel our survey would not be a success. We have not asked him to come to us. We have gone to him for the purpose of furnishing education instruction and guidance. There is a tendency in the United States to compare our statistics with those of European countries to the detriment of the United States. Dr. Thomas J. Duffield of New Jersey wrote in 1923 a graduation thesis for the Massachusetts Institute of Technology in which he shows how divergent the methods are in collecting vital statistics in Europe. Switzerland seems to be the one country which has a fair and accurate method. English statistics are often quoted. Newsholme, in his vital statistics, shows how 1,086 puerperal deaths are eliminated. By his process the death rate in England in one year was reduced from 5.46 to 4.12 per thousand births. The United States Census Bureau will not allow physicians in United States to follow the English plan. Offhand I would say that it would reduce our number of deaths by about 4,000. Under these circumstances would it not be better to compare the statistics of one state with those of another rather than the whole of the United States with those from foreign countries? If we followed English methods our statistics would tell a different story. There is no other country which has to contend with such climatic, social and economic conditions as is the case in the United States. In the South the negro woman has a high mortality rate in the puerperal state. In New England, parturition is safer in August, September and October than it is in March or the beginning of April. Abortions contribute to the increase of a high septicemia rate. These patients for the most part are

infected before they call for medical care. As to practical education, under the guidance of the section of obstetrics and gynecology of the Masachusetts Medical Society a series of obstetric moving pictures was exhibited to nearly 1,000 physicians. We visited eighteen cities and towns. Our attention was attracted by the eagerness and willingness of the physicians to discuss these pictures even until late at night.

DR. JOHN O. POLAK, Brooklyn: I do not want Dr. Mongan to go away with the impression that in my paper I have not taken New York statistics into consideration, and, sad as it may be, they are worse than those of Massachusetts. I took 1,000 cases from Massachusetts statistics because they were better analyzed. They had been analyzed by somebody, so that they showed that in 58 per cent of the cases the cause of death was sepsis, hemorrhage and toxemia, and that in this series there had been a 58 per cent operative incidence. Then I tried to compare these with those of a maternity teaching clinic where students do the work under supervision similar to that at the Boston Lying-In Hospital. That was the only reason Massachusetts was selected rather than New York. We have a tragedy in New York which shows that the city as a whole has a mortality considerably above that of rural districts. What is more, the operative incidence is so high that the commissioner demanded that the Committee on Maternity Hospitals do something to stop the mortality in the small, uncontrolled open hospital. What we are going to do, I do not know. That is the tragedy we have in New York. In regard to Dr. Martzloff's question concerning immunization and sensitization, we are working on that subject at the present time, not quite from the angle taken by Phillips and Ruddy. There is no question that if there is any time we need to protect the woman it is before she is infected. In our clinic, with the cooperation of Dr. W. H. Park and his associates, we have been taking cultures from the vulva, the vagina and the cervix. We have sensitized the women who have not had a streptococcic history with the bacteria that we found, and then have followed them through labor and have taken cultures of the inside of the uterus and blood, and it has been rather interesting to see that the women who are sensitive to streptococci are those who have the greatest morbidity and mortality. We hope to have this work finished by next year, but it is a difficult proposition and it takes considerable time and a great deal of bacteriologic study.

DR. FRED L. ADAIR, Minneapolis: We might as well realize that maternal mortality is not as low as it might be, as shown by comparative statistics. This rests on certain fundamental factors. First is lack of training and proper education, not only of physicians but also of midwives and nurses, along obstetric lines. Second is the lack of proper system with coordination and development of organizations in communities where prenatal and home care should be articulated with proper institutional care. When we come to more direct causes, we have to realize, from an analysis, that many fatalities which might have been prevented appear to have been the result of improper management of early termination of pregnancy. As has been pointed out many times, one can enter a pregnant uterus once with impunity; one may enter the second time at the peril of the patient; but if one enters the uterus of a patient who is febrile he is flirting with death. In 95 per cent of the fatal cases in which curettage was done while the patient was febrile, death occurred. There is too high an incidence of operative procedures. There is probably associated with this an increased tendency to hospitalization of patients which makes it easier for the physician to resort to operative delivery. Between 50 and 60 per cent of the febrile patients after the seventh month had been subjected to operative procedures. The high incidence of cesarean section has been mentioned, and it is noteworthy that in the fatal cases cited (2,650) next to forceps operations cesarean sections predominated among the operative procedures. Another point worth bringing out is the danger of combined obstetric operations. They carry with them a much higher mortality than when one resorts to a single operative procedure. The failure to evaluate cases properly is undoubtedly the reason for doubling obstetric operations. Another point worth stressing is that of these patients only 11 per cent had anything like adequate prenatal care. It is difficult to know from the incomplete statistics how many had proper and adequate intranatal and postnatal care.

SPINAL FUSION OPERATIONS IN THE TREATMENT OF LOW BACK AND SCIATIC PAIN *

FREMONT A. CHANDLER, M.D.
CHICAGO

During the past five years, fusion operations for the relief of low back and sciatic pain have been performed in twenty-nine cases in the orthopedic service of Dr. E. W. Ryerson at St. Luke's Hospital, Chicago. This group of cases has been closely followed and their analysis, here presented, has been made in the hope of revealing some of the etiologic factors as well as the result of surgical treatment. In many respects the study of this group of cases presenting symptoms of low back disability parallels the recent study made by Hibbs and Swift of the New York Orthopaedic Hospital.[1]

All of the cases in this series were chronic in nature and treatment was directed along the more conservative lines of removal of foci of infection, manipulation, the use of external supports and, in several instances, prolonged rest in bed with traction applied to the pelvis. The persistent and recurrent nature of the symptoms warranted the employment of surgical procedures in the hope of obtaining more definite and more permanent relief.

Of this series of patients, seventeen were females and twelve males, this being about the usual sex ratio of "low back" cases as seen by the orthopedic surgeon.

TABLE 1.—*Ages at Time of Onset*

From 10 to 15 years, inclusive	1
From 16 to 20 years, inclusive	6
From 21 to 25 years, inclusive	10
From 26 to 30 years, inclusive	2
From 31 to 35 years, inclusive	7
From 36 to 40 years, inclusive	1
41 and over	2

The ages at the time of operation ranged from 16 to 53 years, the group average being 31.9 years. The duration of clinical symptoms varied from six months to sixteen years, with an average of five and one-half years.

The age at the time of the onset of symptoms varied from 14 to 47 years, with a group average of 26.6 years. These are grouped into five year periods in table 1.

It will be noted that the age of onset was during the later part of the second and the early part of the third decade in the majority of cases, closely corresponding to the period of the completion of the ossification of the various epiphyses of the lower spine and pelvis. In those cases developing after the third decade, there was more association with definite arthritic changes.

In nine instances the onset was associated with trauma, which varied in degree from an overstroke at golf to falls from a height, striking on the buttocks. In two cases the onset was during pregnancy.

Lumbar pain or backache was the outstanding symptom in every case. The degree of discomfort was

* From the orthopedic service of Dr. E. W. Ryerson, St. Luke's Hospital.

* Read before the Section on Orthopedic Surgery at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 10, 1929.

1. Hibbs, R. A., and Swift, W. E.: Surg. Gynec. Obst. 48: 604 (May) 1929.

directly proportional to the degree of strain (static or otherwise) involving the lower spine and pelvis. A definite history of lumbar weakness and discomfort during early childhood was obtained in several instances. These individuals had for years avoided lifting heavy objects and had assumed attitudes which gave comfort, sitting on the floor, hanging the legs over the arm of a chair, or sitting on one foot being quite typical examples of postures assumed to reduce the lumbar lordosis (table 2).

TABLE 2.—*Radiation of Pain*

None	8
Lumbar	0
Right sciatic	6
Left sciatic	2
Right and left sciatic	9
Left gluteal	1
Abdomen	1
Lateral thigh	2
Total	29

In eight cases no history of radiating pain could be obtained. Right sciatic radiation alone was present in six, left sciatic radiation in two, and bilateral sciatic radiation (in some alternating) in nine. Radiation of pain to the left gluteal region was present in one, to the lateral aspect of the thigh in two, and to the lateral aspect of the abdomen in one. "Sciatica" was an outstanding symptom in seventeen of the twenty-nine cases.

The examination of all patients did not reveal any especial conditions that were consistent throughout the series. Exaggeration of the lumbar lordosis was especially pronounced in the group showing lesions of the pedicles or articular processes. In these, contractures of the erector spinae muscle groups were noted. Straight leg flexion tests were not found to be of especial value in the more accurate localization of the lesions. Tenderness in the midline posteriorly at the lumbosacral juncture was the most constant finding, frequently associated with tenderness over the posterior short sacro-iliac ligaments. An interesting finding was the variation of the position of the arc made by the

TABLE 3.—*Roentgenologic Observations*

Sacralization of the last lumbar vertebra (right)	1
Sacralization of the last lumbar vertebra (left)	4
Sacralization of the last lumbar vertebra (bilateral)	1
Spina bifida occulta	4
Irregular articulation at the lumbosacral juncture	6
Sclerosis of the sacro-iliac joints	12
Lesions of the pedicles of the last lumbar	5
Lateral slipping of last lumbar	2
Increased lumbosacral angle	5
Ossification of iliolumbar ligament	1
Osteoarthritis of lumbar spine	6

lumbar spine in positions of lateral flexion, this arc being at a higher level when flexion was away from an area of irritation or toward the side of bony block, as in the sacralization of the costal process. Tightness of the hamstring muscles was most noticeable in cases suggesting spondylolisthesis. In general, the objective manifestations of the low back pain were such as to indicate disease of the various elements of the spine and pelvis but lacked the clearcut differential features so frequently seen in acute lesions of this region.

Roentgenologic considerations were of the highest importance when interpreted in conjunction with the history and physical examination. The types of bone disease revealed by the roentgenograms in this series are presented in table 3.

Roentgenograms were made in both the anteroposterior and the lateral planes in all cases. Stereoscopic views were most helpful, as also were lateral films made with the patient lying and then standing, showing the effect of weight bearing at the lumbosacral juncture.

The roentgenologic diagnosis was found to be the most satisfactory method of recording these cases, as it simplified the terms considerably. That this method is apt to emphasize the rôle of the osseous defects and malformations at the expense of the more important lesions of the ligamentous and joint structures is fully realized. It is quite generally accepted that anomalous bone development in this region is important only so far as it affects the structure and function of the adjacent soft structures.

In the operative stabilization of these backs, Hibbs' spinal fusion of the lumbosacral region was performed in eleven cases. In an additional case the right sacro-iliac joint was fused at the time of lumbosacral fusion. The combined fusion of the lumbosacral spine and both sacro-iliacs was performed in the remaining seventeen cases, the technic (trisacral fusion) recently described by me[2] being used. In the unmodified Hibbs operation of the lower spine, the last two lumbar vertebrae

TABLE 4.—*Results: Average Duration After Operation Sixteen Months*

Excellent	15
Good	9
Fair	2
Failure	2
Death	1
Total	29
Males	12
Females	17

were fused to the sacrum. The great relaxation between the segments of the lower spine was evident after the wide exposure of the posterior portion of the laminae and articular processes.

In this series there was no severe postoperative reaction. Mild shock was present in several cases but responded to the usual postoperative treatment. Opiates were employed during the first two or three days for the control of pain. Several hematomas developed, but in only one did infection occur. In this case, infection involved the entire operative field, extending into the perirenal space on the left side. This was controlled by extensive drainage, and an excellent fusion with relief of symptoms resulted.

Other than for the immediate postoperative care, no especial measures were employed. A hard bed with double mattress was used in all cases. No postoperative support was used during the period of recumbency, which varied from six to ten weeks. On resumption of weight bearing, a heavy fabric corset was employed in all but four cases; in these, body casts were used (table 4).

The results of the fusion operations in this series have been determined by the observations at reexaminations averaging sixteen months after operation. Several cases of recent date are included because of the definite change in symptoms. In fifteen cases there was complete relief of symptoms and the result may be considered excellent from the standpoint of the

2. Chandler, F. A.: Surg. Gynec. Obst. 47: 501-506 (April) 1929.

patient as well as the surgeon. In nine cases the results were entirely satisfactory to the patient but could not be considered more than good because of some discomfort on certain motions of the spine. In two the result may be classified as fair. Both cases showed generalized arthritic changes. Two cases, showing no change in symptoms after lumbosacral fusion, are considered failures.

One of these patients is in the ward at the present time. Bilateral sacro-iliac fusion is being considered after negative observations on a general review of the case. One death occurred one month after operation. No surgical complications developed, death following an exacerbation of a preexisting mental derangement of several months' standing.

Sciatic symptoms disappeared less rapidly than did low back pain, probably because of the irritable state of the nerve elements following prolonged insult.

In one instance (case 4) lumbosacral fusion of a sacralized fifth lumbar vertebra gave complete relief of sciatica. On two subsequent occasions there have been acute strains of the sacro-iliac joints not operated on, evidenced by local pain and tenderness. The absence of sciatica in this case has some significance as to the location of the sciatic lesion.

CONCLUSIONS

1. Developmental anomalies of the lumbosacral region are of great importance when associated with low back and sciatic symptoms.

2. Combined lesions of the lumbosacral and sacro-iliac joints are not uncommon.

3. Sciatica is frequently due to pathologic changes in the lumbar spine and may occur without lesions of the sacro-iliac joints.

4. Fusion operations eliminating motion at the lumbosacral and sacro-iliac joints have a definite place in the treatment of low back and sciatic pain.

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ABSTRACT OF DISCUSSION

DR. H. W. MEYERDING, Rochester, Minn.: Dr. Chandler has given an able presentation of the surgery of the lumbosacral and sacro-iliac joints. I have no doubt that the future will prove that this is a useful aid in our armamentarium in the treatment of these chronic backaches, and I am impressed by the fact that he is operating only in long-standing cases, and practically all the patients are adults. I think he stated that the duration of symptoms was more than five years and that the average age was around 25. That has been along much the same line of experience as mine. The patients that we operate on are practically all adults with long-standing cases who have suffered, and who have tried all methods of treatment without relief. We are not satisfied with the clinical examination and we are not satisfied with the roentgen examination in determining the cause of this backache, but we subject our patients—or practically all of them—to the examination of the neurologist and the gynecologist. We have discovered that spinal cord tumor is often unrecognized. It has been my experience that spondylolisthesis has been overlooked, and I have personally examined more cases of spondylolisthesia in the last twenty years than are reported in all the literature that I could find on the subject. The patients with chronic backache therefore present to us a difficult problem in determining whether or not their condition is surgical from the orthopedic standpoint. We must eliminate many factors, such as arthritis and posture, for backache is most common in the adult. Anomalies are common; yet in my experience these people may be perfectly normal and will have no symptoms whatever as a result of the deformity. Therefore, my point is that operation should not be done in these lumbosacral and sacro-iliac cases until an exhaustive physical and roentgen examination has been made, and it might even be well to check up on the neurologic conditions first.

DR. EDWARD A. RICH, Tacoma, Wash.: Fusion operations unquestionably are a necessity in some uncontrollable bone conditions in the lumbosacral spine. When irritations of the soft parts do exist, when muscles, nerves and ligamentous structures are being actually irritated because of distortions and abnormalities, it is reasonable to limit the annoying motions and give rest. At times conservative measures give most excellent results; the army belt, the girdle and the surcingle will relieve many. In case of failure, solid ankylosis by means of fusion is imperative. The only point to be certain of is that body motions are the causative factors in the production of the backaches and the sciaticas. It has always been my belief that when a fusion seems necessary, a therapeutic test of rest should always precede surgery to make certain that motions are actually causing the symptoms. If rigid enforcement of rest in a bed and in a pelvic hammock does not check the local pelvic pain, the chances are all against success in fusions or bone grafts; we had better look elsewhere for a cause. I agree with Dr. Chandler in the efficacy of an extensive fusion of a large number of vertebrae, the sacrum and both ilia. We must immobilize both ilia. We go further and add osteoperiosteal grafts over the fused areas. In the state of Washington the industrial insurance commission, recognizing the economic value of spinal fusions in lower spinal conditions of a chronic nature, have in a rather routine manner insisted on fusions in cases in which conservative measures have failed. It is only reasonable to deduce that they are assured that thorough bony fusions, in competent hands, are giving good results.

DR. LEONARD W. ELY, San Francisco: There was one question on which Dr. Chandler did not touch, and which is of great interest to us in San Francisco. I have never heard it discussed anywhere else. It has come to be an accepted fact with us. Whether or not it is an established fact, discussion should bring out, and I should very much like to hear an expression of opinion from men in other localities as to whether or not we are correct. The question concerns the so-called sacro-iliac slip. In a typical sacro-iliac slip we find that it is impossible to establish it by any known method. When we come to the treatment, however, of the typical sacro-iliac slip, we often cure it. Where the idea came from, I do not know. At Stanford we got it from Dr. Chamberlain of the roentgen department, and I think he says he got it from Dr. Stoddard. In all our work on the so-called sacro-iliac slip, the roentgenograms include the pubic symphysis, and we find that the slip is at the pubic symphysis, and that the high side is usually the seat of the sciatic pain. The sacro-iliac slip is nothing more than a subluxation at the symphysis pubis. If, as is usual, the pain is on the high side of the pubis, on the side where the sciatica is, then the old fashioned treatment of sciatica by a forced Kernig manipulation, the so-called dry stretching of the sciatic nerve, will not be of any service. These cases are cured only by the other old fashioned manipulation, the so-called bloody stretching of the sciatic nerve, namely, superextension of the affected side.

DR. THOMAS A. STODDARD, San Francisco: We have been practicing this method since 1917. I suggested it to Dr. Chamberlain, who was then associated with me at the Children's Hospital in San Francisco. I do not know where I got the idea. It was a question of studying the sacro-iliac joint conditions and getting the proper films to demonstrate them. Dr. W. B. Coffey told me that these so-called sacro-iliac slips were costing his company a great deal of money. He had a man anesthetized and placed on a table, and applied traction in different directions and then made roentgenograms. No sacro-iliac distortion was demonstrated; hence he claimed that the sacro-iliac slip was impossible. I think this conversation set me to studying this condition. We have found that by having these individuals stand and throw the weight from one leg to the other, we have been able to demonstrate a distorted position or abnormal mobility. After manipulating these patients under an anesthetic we have been able to reduce the distortion and have not found it necessary to operate. Our results have been brilliant in some cases.

DR. F. A. CHANDLER, Chicago: In regard to Dr. Meyerding's statement regarding the use of other hospital departments in the diagnosis of these cases, I may say that such consultation has been extensively employed in this series, especially the neurologic service. Most of the female patients were referred to us by the gynecologic department. Much needless abdominal surgery has been done in this type of case, as is evidenced by the multiplicity of surgical scars on the abdomens in many of these cases. The test of rest may be abused and may result in the atrophy of the muscular and ligamentous structures. This occurs with the prolonged use of braces or corsets. In one case I was able to demonstrate motion through a range of more than 1 cm. at the sacro-iliac joint. This is sufficient to permit definite subluxation of this joint. Lesions of the pedicles, articular processes and laminae are often unrecognized. Dr. Willis of Cleveland has demonstrated the great frequency of these lesions. Nonunion of the pedicle or lamina was present in five cases.

FACTORS IN RECOVERY FROM TUBERCULOSIS *

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In this discussion of the factors involved in recovery from tuberculosis, I have no intention of considering the treatment of the patient or of his disease. Rather, I shall endeavor to relate briefly those things aside from treatment which, in my experience, have a profound influence on the recovery of the patient and which, sometimes, seem of more importance than the particular type of regimen the patient follows.

Some of these factors can be determined by the physician from the facts obtained during the taking of the history or can be elicited by examination. Others cannot be so estimated and can be learned only later as a result of observation and continued study of the patient.

There are two things which the physician cannot estimate after a first examination. One is whether or not the individual patient will or will not recover. The other is how long it will take the patient to recover, in case the outcome is favorable, or how long will be the struggle should the result be unfavorable.

The reason for the inability to answer these, to the patient as well as to the physician, very important questions, lies in the number of factors that must be included in what may be termed "imponderables."

The factors in recovery from tuberculosis fall roughly into two groups: (1) those related to the type of person who has the disease, and (2) those having to do with the disease itself.

Group 1 includes those factors, among others those classed as imponderables, having to do with (*a*) temperament, (*b*) individual resistance to disease, (*c*) finances and (*d*) time.

In perhaps no other disease does recovery depend so much on the temperament as is the case in tuberculosis. The length of cure demands great reserves of patience and cheerfulness; the necessary regimen exacts rigid discipline. In a disease in which the time element is of vast importance and treatment must be carried on for months and years instead of for days and weeks, in a disease characterized by deceptive remissions, sometimes of several months' duration, followed by unexpected and depressing exacerbations, the psychology of the patient plays a very important rôle in cure.

The restive individual, impatient of restraint and of discipline, or the pessimist, who minimizes his remissions and magnifies his exacerbations, frequently forsakes the slow, safe regimen of rest and time and seeks relief in highly exploited quick cures; while the cheerful, more optimistic, better disciplined individual, cheered by his remissions and not unduly depressed by his exacerbations, patiently pursues the slower but surer dietetic-hygienic regimen to recovery.

The individual resistance to tuberculosis is probably the greatest single factor in recovery. It is something which no one can estimate in advance by means of any instrument of precision and yet on the patient's resistance to the effect of tuberculosis toxins depends, in a large measure, the result of treatment. Some patients with advanced disease have this quality in large measure and, in spite of extensive disease, improve steadily and ultimately recover; while other patients with relatively little disease, lacking this quality, as steadily and progressively decline. Every physician with large experience in the treatment of tuberculosis has seen numerous instances illustrating the truth of these statements.

Whether the resistance of some patients and the lack of resistance of other patients is due to the presence of certain qualities in tissue cells and fluids or to the lack of certain qualities in cells or fluids is not within the scope of this paper. There is no doubt that such a quality as specific resistance to tuberculosis does exist and that no two individuals have this quality in the same degree. Nor is there any doubt in my mind that such resistance is related in some way to inherited family and racial characteristics. To me it seems the most important single factor in cure.

There is a third factor in group 1 which is fortunately becoming yearly of less importance. This is the financial standing of the patient—his ability to finance the cure and to weather the long period of enforced idleness. Formerly many patients died not of tuberculosis but because of lack of funds. Today, however, as a result of the more general recognition that tuberculosis is an economic problem as well as an infectious disease, more and more provision is being made for state, county and municipal care of patients unable to finance the treatment unaided. Thus, the financial factor in recovery is becoming relatively of much less importance.

Closely associated and bound up with these three factors relating to the psychology, to the resistance and to the financial status of the patient is another of the imponderables; namely, the element of time. Time is of the essence of cure. The course of the average disease is measured in days or weeks; that of tuberculosis in months and years. There is no means by which the extent of this factor as regards the given patient can be determined. The answer unfolds only with the passage of the months or years, as the case may be.

As has been stated, this factor is closely related to those preceding. The optimistic, cheerful patient accepts philosophically the time element; the unstable, the undisciplined and the morbid rebel against it.

Likewise with the quality of resistance. With the highly resistant patient the time of cure is, other things being equal, of relatively short duration. With the patient of poor resisting power, the duration of cure is lengthened.

But it is with regard to the financial resources of the patient that the time of cure is of most importance. The early highly resistant patient, who might secure an arrest in eight months, may be able to finance his cure

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for only four months and, returning to work too soon, suffer a relapse which ends fatally; while a more advanced patient with poorer resistance but with plenty of funds may win the fight. It is not possible to improve the temperament or the intelligence of the patient markedly, nor to influence for good the power of resistance of his body cells and fluids; but there should be, everywhere, state, county or municipal aid in order that every needy patient may be able to finance the treatment to the end of the time necessary to accomplish the cure.

Group 2 includes (*a*) the extent of the disease when discovered, and (*b*) the time when diagnosis is made. These two factors may seem, at first glance, to be one and the same; but, while at all times related and at times coincident, they may be quite distinct, depending largely on the acuteness or the chronicity of the process or on some accident which has to do with the reason for the extension and lighting up of an old quiescent focus. Thus, a slowly advancing chronic type of lesion, though discovered at what may be called a late stage, when considered solely in relation to the interval of time extending from the appearance of the first symptoms to the date of diagnosis may, under appropriate treatment and with proper supervision, do well. On the other hand, an acute pneumonic process of the rapid fulminating type due, perhaps, to some accident precipitating the recrudescence of a formerly quiescent process, such as the discharge of an overwhelming number of tubercle bacilli from an old caseating lymph node into the thoracic duct or into a blood vessel, may be discovered early in point of time but in an advanced state in point of pathology, and the patient may fail to recover in spite of a so-called early diagnosis.

This short and incomplete summary of factors involved in recovery from tuberculosis is presented to give some slight idea of the complicated problem with which the physician is confronted in attempting to reach a prognosis when estimating the probable outcome in the individual case of tuberculous disease. It explains, in a measure, why it is impossible to give a definite answer to the two questions formulated earlier in this paper. It is not intended, in any manner, to minimize the extreme importance of early diagnosis. Early discovery of disease, whether tuberculous or otherwise, means early treatment and, *ipso facto*, a more favorable prognosis. All of us see only too frequently the sad results of a diagnosis made months late with the consequently lengthened period of convalescence and with too often a resultant mortality when an earlier diagnosis, which should have been made, might have meant a much more favorable result. But, on the other hand, we have seen also many cases in which the diagnosis has been made early in point of time, but late from the standpoint of pathology, as a result of some accident incidental to the spread of the tubercle bacillus with the inevitable unfavorable result. All of us have seen the patient with an early diagnosis but lacking in the necessary intelligence to follow the treatment to an arrest, who mistakes a speedy convalescence or a long remission of symptoms for a cure, and refuses to take advice, with a resulting unfavorable ending. All of us have seen the patient with an early diagnosis and with limited pathologic involvement who, in spite of every care, in spite of complete cooperation between patient and physician, goes steadily down hill because of the lack of that quality which we call resistance.

CONCLUSIONS

The factors involved in recovery are many. They include not merely early diagnosis, which, while of extreme importance, is but a small part of the picture. Other factors include the type of disease, whether chronic or acute; the mental reaction of the individual to his disease; his ability to cope financially with the element of time, and, last and most important of all, the specific reaction of his body cells—his resistance or lack of resistance to the toxins of the tubercle bacillus.

ABSTRACT OF DISCUSSION

DR. WILLIAM VOORSANGER, San Francisco: What Dr. Peers has said is so self-evident that if we were purely tuberculosis men there would be no room for discussion. In spite of the obviousness of all these statements, in spite of having preached this for many years, we are still confronted with a factor in treatment which sometimes proves disastrous to the patient; namely, that neither the patient nor his physician recognizes the time element in the treatment of tuberculosis. We all get patients who have been told by their physicians that two months of treatment would make them well. We cannot cure people in two months. We might as well tell them that from the start, but sometimes one allows oneself to be persuaded that the psychology of the patient will not permit telling him the facts. Then after two months one tells him that he has to stay longer, and he loses faith in his physician. This time element should be stressed not only with the patient but with his physician, so that his physician will not tell him he is going to get well in four weeks or two months. The tuberculosis movement has given us one important therapeutic measure—rest. Rest has been adopted in the treatment of other diseases. Rest does not mean that one can put a person to bed for a week or two and get him well. We should at all times stress this point. In the matter of early diagnosis we see some deplorable results. I saw one just before I left home. One of our most able nose and throat physicians had been treating an ulcer of the pharynx for eight months as Vincent's angina because he found spirochetes in the sputum. I am not condemning him or criticizing him, because he did not know that spirochetes could appear in the sputum in many cases of tuberculosis. I do blame him, however, because he did not examine the sputum for tubercle bacilli nor did he make a roentgen examination of the patient's chest, but kept the man coming to his office until he collapsed. He died four days after the diagnosis was made.

DR. F. M. POTTENGER, Monrovia, Calif.: Dr. Peers' paper sums up very well the difficulties of cure and also the factors which are of value in healing. I think the psychology of the physician in being able to alter and direct the psychology of patients is the most important factor in treating tuberculosis. Either the physician can transmit optimism and a spirit of cooperation or he can take away hope and fail to secure cooperation on the part of the patient. I always try to avoid answering a question directly as to whether a given patient can get well, because I do not know. Many patients who seem in practically a hopeless condition when put under proper care and treatment surprise us by at least getting better, so that they can live in comfort for some years, and perhaps recover. Therefore I think it is much better to postpone the answer to that question until later. Giving the patient a general talk on the curability of tuberculosis creates hope and a desire to cooperate in order to secure the greatest advantage from treatment. Temperament is of tremendous importance in meeting any disease, particularly a chronic one. I sometimes think the manner in which the patient adjusts himself to his disease and to the surroundings in which he is thrown, how he meets his social, economic, domestic and financial problems, has more to do with his getting well than almost any other factor. The element of time is extremely important. The result depends on the time the diagnosis is made, the time that treatment is instituted and the length of time it is carried on, as well as on the degree of cooperation that the patient will give. As soon as the diag-

nosis is made, no matter how early, the patient should immediately be put under proper treatment. There is no time to delay after the disease assumes the aspects of a clinical disease —that is, after it produces symptoms that are recognizable. Resistance is an extremely interesting and a vague thing. We talk about it, but we do not know what it is. We see one patient advance more toward healing in three months than another in six, although the two make apparently the same effort. There are undoubtedly certain inherent characteristics —something in the physics and chemistry of the cell, something in the endocrine predominances of the individual, something in his psychic reactions, something in his nerve balance—which determines how he will withstand stresses and what his reaction toward disease will be.

DR. W. P. SHEPARD, San Francisco: From the standpoint of the administrative control of tuberculosis there is a problem that troubles us a great deal. One can go into almost any school district and find from 5 to 15 per cent, and perhaps more, of the children who will fall into what is commonly called the pretuberculous class. If that is the case it seems impossible for us to persuade county boards of supervisors and other appropriating bodies to furnish preventoriums where such children can be given what is known as the preventorium regimen. Such being the situation it seemed to some of us, especially in California, that we might be able to persuade boards of education to so modify the school curriculum that at least the essential treatment could be given. I have in mind specifically what Dr. Pomeroy and I have called the sunshine school. We have these pretuberculous children sent to such a school and they are given at least two hours' additional rest each day on comfortable cots or beds. We give them an hour or more of sunshine, if the sunshine is available. We give them a supervised hot lunch at noon, and then concentrate on their home environment. That has been fairly successful. Our results so far have been good. The question comes up whether it is possible to select the pretuberculous child on anything like an accurate basis. Dr. Casparis suggests the tuberculin test for doing that. Dr. Pottenger's exhibit indicates that perhaps all these children should be examined roentgenographically. Is there any method that is feasible from an administrative standpoint whereby the child can be selected with a fair degree of accuracy? If selected and when selected with this abortive regimen, such as Dr. Peers is familiar with, is this method going to be better than the present system of preventorium treatment? It is an easy thing to get school boards to do because they realize their responsibility, but is it going to give us any more permanent results in protecting the pretuberculous child? The time is near when Dr. Peers and Dr. Pottenger may begin to find people in their sanatoriums who may have had in their youth the benefit of the preventorium regimen. This is a question that should be answered soon.

DR. ROBERT A. PEERS, Colfax, Calif.: Dr. Shepard really knows more about the questions that he propounded to me than I do myself. In the first place, I see no children whatever. Of course, I am interested in them because they are the ones from whom the tuberculous adult is drawn; but as far as having practical experience with preventoriums and sunshine schools and other efforts of that sort, I have had none at all. I have always felt that a preventorium was an expensive way of handling the problem. The preventorium costs a good deal per child, and if we had to depend entirely on preventoriums, we would not get very far. I have, however, felt that the preventorium is good because it is a sort of laboratory in which to work out problems. Every child who goes in has parents or friends who are educated in the value of fresh air and rest, sunshine and good food, and every child going out becomes a missionary to other children. While it has cost a lot of money to have preventoriums, it has been worth while. There is one tremendously important fact about the sunshine school: the element of time. The child who goes into a preventorium stays from three to nine months, but the child who goes to the sunshine school stays years, and he always carries that education into the home for the benefit of the other children. He carries the same idea through life because he has had the years of training in a sunshine school during a very impressionable period.

POSTOPERATIVE EMBOLISM AND PHLEBITIS *

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The consideration of this subject is fitting, in view of the generally accepted increase in the occurrence of postoperative pulmonary embolism. Most authors agree that the percentage of its incidence is greater than it was even a few years ago.[1] No definite cause for this has been found.

A discussion of blood coagulation would be timely, but it would lead us far away from our subject, and there is not yet entire agreement on it.[2] Most instances of fatal embolism occur in cases in which there is no evidence of phlebitis; therefore an explanation must be found for this clinically hidden thrombus formation. The best theories are expressed by Aschoff,[3] who says that several factors are concerned. He assumes a slowing and eddying of the venous circulation, most marked in the veins of the leg, the upper part of the femoral veins and the pelvic plexus, with a resulting deposit of blood platelets near the valves, much as particles floating in a stream of water of changing velocity may be sifted to the bottom. As a result of operation or disease, these platelets probably are increased in number and have increased power of agglutination. They collect, and some interaction takes place between them and the vessel wall, to which they become adherent, and a clot is inaugurated which is augmented by more platelets, white corpuscles and fibrin, forming a white thrombus which blocks the vein; as soon as this happens, the flow of blood through the vessel ceases, and a red clot forms and extends as far as the next entering vein. Whether there are changes in the vessel wall and what they may be are little understood. Fähraeus [4] has noted that decreased sedimentation time of the red cells may have some influence in starting the thrombus, but there is as yet no definite evidence for this statement. Various writers speak of postoperative changes in the blood plasma, increase in the number of platelets and disturbance in the equilibrium between coagulants and anticoagulants; no one seems to have succeeded in putting his finger on just what is the factor of outstanding importance.[5]

The large emboli which cause sudden death are casts of a long vein of considerable size. They do not usually arise from the site of operation [6] because, even if this is above the diaphragm, the thrombus commonly forms

* From the Clinic of the Massachusetts General Hospital.
* Read before the Section on Surgery, General and Abdominal, at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 10, 1929.

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2. Howell: The Problem of Coagulation, Pasteur Lecture, Nov. 28, 1924, pp. 139-163.

3. Aschoff, Ludwig: Thrombosis, Lectures on Pathology, New York, Paul B. Hoeber, 1924, p. 253.

4. Fähraeus: The Suspension Stability of the Blood, Physiol. Rev. **9**: 241 (April) 1929.

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in the iliac or the femoral vein. Bernheim[7] has recently suggested that most emboli come from the pelvic veins and the great veins of the neck; the latter locus of thrombus formation has not previously been put forward. They are probably not dependent to any extent on wound trauma or infection.[8] In regard to the importance of infection there is some difference of opinion,[9] but the fact that so many fatal cases occur after clinically clean operations or in closed fractures is, *ipso facto*, an argument against it. The question of the brittleness of the thrombus, which allows clots to be broken off in some instances but not in others, demands further study.[7]

Any foreign substance introduced into the venous circulation is carried to the heart and thence to the lungs. Warthen found that in dogs metallic bodies reached the lungs while smaller and lighter bodies tended to collect in the apex of the right ventricle.[10] Mann experimented with artificial emboli of melted wax, as well as blood clot, but was unable to determine the exact cause of sudden death.[11] It has been shown that it takes a blocking of between 52 and 66 per cent of the pulmonary circulation, in the cat, to result in death. The point at which failure occurs is sharply defined.[12]

No one has ever been able satisfactorily to account for the sudden death on the basis of the shutting off of the lung. Lockhart-Mummery says it is due not to a reduction in breathing surface but to the obstruction of the circulation between the right and left auricles.[13] It seems fair to assume that a sudden shutting off of half the pulmonary circulation, with the increased back pressure on the right side of the heart, may be enough to distend it to such a degree that it is at once overwhelmed.

Various predisposing factors have been discussed, such as preoperative intravenous medication, but there is no adequate reason for this assumption.[14] Injections of arsenic preparations for syphilis have not been followed by massive thrombosis and embolism. Some of the German writers think that the war and postwar periods, during which people were not well nourished, may have had some influence.[15] Various articles of diet, alcohol and tobacco have been claimed as factors; also the therapeutic use of metals.[15] One factor that may be accepted as important is obesity[16] and this probably is effective because the patient moves about less in bed and has a more sluggish circulation. Trauma and operations for trauma seem to have a high incidence of embolism.[17] The blood pressure is usually normal or subnormal.[18] Dehydration is doubtless important. The injection treatment of varicose veins has been responsible for five cases of embolism in 53,000 injections—0.01 per cent.[19]

A survey of many studies reveals several well authenticated facts which will be briefly recapitulated.

1. Fatal embolism is most common after abdominal and pelvic operations but may follow procedures on the chest, extremities or head.[20]

2. The primary thrombus is usually in the iliac or the femoral veins.[21]

3. There is great variation in the postoperative interval preceding the onset. The average is in the neighborhood of ten days.[22]

4. Fatal embolism may result from phlebitis, but it is rare.[23]

Assuming that among the more important predisposing causes is slowing of the blood stream because of the quiet recumbent position in bed, the chief prophylactic measures now employed are early exercising in bed,[24] massage,[25] increase in body fluids,[26] the use of digitalis or other heart tonics,[27] and thyroid extract as suggested by Walters.[28]

The operation for removal of a clot from the pulmonary artery was first performed by Trendelenburg. Recent reports of such operations may be found, among which are those of Meyer with two cases, one successful;[29] Nyström with three cases, one successful;[30] de Harven with three cases, all fatal,[31] and Crafoord with two cases, both successful.[32] Success in this operation necessitates a degree of preparedness and speed which is almost impossible of attainment; it has been argued that the patients who have been successfully operated on would have recovered anyway, without operation.[13] It certainly is true that a large proportion of the patients die before one could possibly do anything radical.

OBSERVATIONS

We will present briefly our cases from the clinic of the Massachusetts General Hospital, covering the period from 1900 to 1927. The total number of cases is 113, of which sixty were confirmed by autopsy. Of the fifty-three without autopsy, forty were postoperative and thirteen medical. Of the operations, only sixteen were abdominal, and twelve were above the diaphragm; three were fractures, and two amputations. Of the thirteen medical cases, six were primarily cardiac and three were acute infections. Though it is not positively proved, these cases suggest that, as other writers have noted, it is by no means necessary that the operation be

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13. Lockhart-Mummery (footnote 6).
14. Oberndorfer (footnote 1).
15. Pfleiderer: Zur Emboliefrage, München. med. Wchnschr. **75:** 859 (May 18) 1928.
16. Snell, A. M.: The Relation of Obesity to Fatal Postoperative Pulmonary Embolism, Arch. Surg. **15:** 237 (Aug.) 1927.
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19. Kilbourne, N. J.: Treatment of Varicose Veins of the Legs: Considerations of Safety, J. A. M. A. **92:** 1320 (April 20) 1929.
20. Henderson (footnote 18). Schumacher (footnote 9).
21. Hall (footnote 18).
22. Gibson: Pulmonary Embolism Following Operation, M. Rec. **75:** 45-47, 1909. Wharton, L. R., and Pierson, J. W.: The Minor Forms of Pulmonary Embolism After Abdominal Operations, J. A. M. A. **70:** 1904-1910 (Dec. 2) 1922. Farr and Spiegel: Pulmonary Infarction and Embolism, Ann. Surg. **89:** 481 (April) 1929.
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24. Schumacher (foonote 9).
25. Cantelmo, O.: Le embolie post-operative fulminanti, Riforma med. **43:** 1120 (Nov. 21) 1927.
26. Farr and Spiegel (footnote 22).
27. Schumacher (footnote 9). Cantelmo (footnote 25).
28. Walters: Reducing Postoperative Pulmonary Embolism, editorial, Surg. Gynec. Obst. **45:** 238 (Aug.) 1927.
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an abdominal one, and that of the medical diseases, cardiac lesions and acute infections rank high in the list of predisposing causes.

Of the total number of patients, the average age was 48.6 years. Fifty-seven of the patients were over 50.

TABLE 1.—*Distribution of Incidence in Sixty Cases of Pulmonary Embolism with Autopsy and Fifty-Three Cases Without Autopsy (Average Age, 48.6 Years)*

Seventy-Six Operative Cases	Autopsy	No Autopsy
Abdominal and hernia	23	16
Operation above diaphragm	5	12
Fractures	4	3
Genito-urinary operations	3	6
Amputations	1	2
Miscellaneous	0	7
Totals	36	40
Thirty-Seven Nonoperative Cases		
Cancer and debilitated states	9	0
Acute infections	8	3
Cardiac disorders	4	6
Miscellaneous disorders	3	4
Totals	24	13

The average age of those proved by autopsy was 49.7, practically the same as that of the total group. The youngest patient, whose case was quite extraordinary, was 1 year and 10 months of age, with sarcoma of the kidney and suppurative nephritis.

The cases in which autopsy was performed are as shown in table 1.

These figures show that only 64 per cent of the operations are comprised under the heading "abdominal and hernia," and that 25 per cent of the operations are either above the diaphragm or of the extremities.

The average length of time from operation to occurrence of the embolus was 11 days.

The site of the thrombus was mentioned seventeen times; it was in the iliac or femoral veins in thirteen

TABLE 2.—*Cases of Embolus Which Came to Autopsy*

Nonoperative	No.	Postoperative	No.
Cancer and debilitated stages	9	Abdominal and hernia	23
Acute infection	8	Above diaphragm	5
Cardiac lesions	4	Fractures	4
Miscellaneous	3	Genito-urinary	3
		Amputation	1
Total	24	Total	36

of these, and in nine instances was on the left side. The embolus plugged the right pulmonary artery in seven out of fifteen cases, both pulmonary arteries in five, and the left in only three.

Of the sixty cases coming to autopsy, in exactly five, or 8.3 per cent, there was a definite phlebitis of the leg. In each of these the phlebitis might have been the primary cause of the thrombus from which the fatal embolus was detached; in fact, in four of the five it probably was the initiating factor. In the same sixty cases, eight patients had varicose veins; in seven no connection was traced between the veins and the thrombus, but in one the fatal embolus apparently came from a thrombosed saphenous vein secondary to varicosities on the same side.

These figures suggest the following conclusions, much like those of other authors:

1. The site of operation, operative trauma and wound infection are not of major importance.

2. Phlebitis has a slight but definite and dangerous significance. An average of one in twelve of our patients died following it.

3. Varicose veins are of little or no significance.

4. Most patients are 50 years or more of age.

5. In many medical cases, as well as surgical, the patients die of pulmonary embolism, and the medical conditions in which it most often occurs are cancer and debilitated states, acute infections and heart disease.

6. The primary thrombus is usually in the femoral or the iliac veins, and on the left side more often than on the right.

We have reviewed 206 consecutive cases of phlebitis, occurring in recent years, and find that exactly 103 were postoperative and 103 were medical. Of the total number of patients, thirty-four were noted as being especially obese. Of the 103 patients not operated on, thirty-six had no other diagnosis than phlebitis, sixteen had complicated acute pulmonary disease, eleven cardiac disease and four typhoid; the rest can be classed as miscellaneous. The 103 surgical cases followed abdominal and hernia operations in 61 per cent, the rest being scattered. Of these 206 patients, seven died suddenly and five were proved by autopsy to have had pulmonary embolism. The other two probably had it also. These figures confirm the opinion that phlebitis is of distinctly serious prognostic significance.

TABLE 3.—*Site of Clot in Fatal Pulmonary Embolism*

	No. Cases	Per Cent
Site of thrombus (17 cases)		
Iliac or femoral	13	76
Left side	9	69
Location of embolus (15 cases)		
Right pulmonary artery	7	46.6
Left pulmonary artery	3	20
Both pulmonary arteries	5	33.3

EXPERIMENTAL WORK

The report of our experimental work must be considered a preliminary one. Our original intention was to develop a uniform technic for producing thrombosis in living cats, and then to study the influence of varying factors on its formation.

We were confronted at the outset with the extraordinary difficulty of producing true thrombosis, and this in spite of the fact that the clotting time of cat's blood in vitro is approximately the same as that of human blood, as shown by Linton in our laboratory.

We carried out a series of sixty-three observations on the femoral and iliac veins, including a few on the saphenous and vena cava. The procedures were varied, the principal ones being: (1) simple occlusion of the vein with one or two ties; (2) occlusion of a vein with

TABLE 4.—*Incidence of Varicose Veins and Phlebitis of the Leg in Sixty Cases of Pulmonary Embolism Coming to Autopsy (Average Age, 49.7 Years)*

	No. Cases	Per Cent	
Phlebitis of leg present	5	8.3	4 of these probable cause of embolus
Varicose veins of leg present	8	13.3	1 of these probable cause of embolus
Neither present	47	7.8.3	

simultaneous tying of the artery; (3) partial occlusion of a vein, thus slowing the venous current; (4) injection of muscle extract into a vein, distal to a tie; (5) introduction of muscle tissue into a vein; (6) thyroidectomy, followed by injection of muscle extract or muscle tissue into a vein, and (7) introduction of muscle tissue with simultaneous subcutaneous injection of epinephrine.

In all the sixty-three observations made there was only one in which a definite progressive thrombus formed; in one other case there was a localized but definite thrombus, and in thirteen there were very small mural clots with no sign of extension. The case which showed progressive thrombus formation was in an infected wound, accompanied by edema of the whole extremity, probably from periphlebitis, and blocking of the lymph vessels, as described by Homans.[33] Homans, using dogs, failed to produce thrombosis by ligation, injection of muscle extract or injuring the intima,[33] though in two cases he produced it by a combination of ligation and injection of broth culture of *Streptococcus viridans* into the vein.[34]

In the first place, our results confirm the observation of Welch, who said that "a stationary column of blood included in an artery or vein between two carefully applied aseptic ligatures within the living body may remain fluid for weeks." [35]

In the second place, they indicate that ordinarily bruising, clamping, perivascular infection, injection of muscle extract and muscle tissue all fail to induce progressive thrombus formation, such as one sees in postoperative thrombosis in human beings. The results were not appreciably influenced by previous thyroidectomy. There are so many other factors, however, that this does not, to our minds, reflect on the clinical use of thyroid extract as a prophylactic measure against thrombosis.

It must be noted that a laboratory animal gets up and walks about immediately after an operation, whereas man lies in bed for days, moving as little as possible; the human circulation would be slow and sluggish, while that of an animal would be of normal speed. The value of these observations is a negative one. They recall to our attention the difficulty of producing intravenous clotting and the fact that local injury and infection of the veins are not usually capable of producing progressive thrombosis, at least in an animal. The postoperative slowing and eddying of the blood stream, the blood changes and the deposit of platelets (Aschoff) seem to us of great importance. These conditions doubtless are brought about in part by the motionless, supine position of the patient in bed.

TABLE 5.—*Occurrence of Fatal Embolism in 206 Cases of Phlebitis*

Postoperative phlebitis	103
Nonoperative phlebitis	103
Sudden deaths	7*

* Five of these patients (2.4 per cent) proved by autopsy to have had pulmonary embolism.

There appears to be no counterpart in laboratory animals of the type of sudden death sometimes seen in human beings without complete blocking of the pulmonary arterial tree (Mann, Walker and Haggart). From observations on animals dying of pulmonary artery occlusion and showing enormous dilatation of the right side of the heart, it would seem possible that this type of sudden death in man may be primarily a cardiac phenomenon. We are now investigating the effect of venesection, on the theory that the heart may be able to compensate for a more gradually imposed overload and that a large factor in the sudden dilatation of the heart in these cases is the high venous pressure, which may be reduced by venesection.

In conclusion, it seems probable that the rate of circulation in the postoperative patient is the most important single factor in the production of thrombosis and embolism. At all events, it is a factor susceptible of manipulation, and until further evidence is available it must be the object of most of our prophylactic efforts.

TABLE 6.—*Experimental Thrombosis of the Femoral and Iliac Veins in Cats (Sixty-Three Observations)*

Progressive thrombosis	1
Small clot	1
Tiny clots	13
No clotting	48

This includes such measures as: (1) active and passive motions of the legs beginning immediately after operation, (2) massage, (3) deep breathing exercises, (4) keeping the body fluids at the normal level and (5) the use of thyroid extract.

After the occurrence of massive embolism, most of the current measures are futile. The Trendelenburg operation has been successfully performed, but it is far from being a practical procedure. Artificial respiration has occasionally seemed a life-saving measure and cannot do harm. Cardiac stimulation, as pointed out by Lockhart-Mummery, is like beating a willing horse, but we may find a place for it in combination with venesection.

CONCLUSIONS

1. A great variety of procedures fail to reproduce in the laboratory animal the thrombus formation characteristic of that found postoperatively in human beings.

2. In only one of the sixty-three experiments done by us was progressive thrombosis produced.

3. The occurrence of massive pulmonary embolism in human beings is the result of a static thrombus, not necessarily or usually from the site of operation.

4. The danger of pulmonary embolism from varicose veins of the legs has been overestimated in the past.

5. Clinical phlebitis may still be considered a potential forerunner of pulmonary embolism, but only to the extent of 2.5 per cent in our series of 206 cases.

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ABSTRACT OF DISCUSSION

DR. WALTMAN WALTERS, Rochester, Minn.: Postoperative pulmonary embolism is one of our greatest surgical problems. In a recent review of operations on the biliary tract, the majority of deaths listed were the result of fatal postoperative pulmonary emboli and complications of the lung, some following pulmonary infarction. Supplementing the authors' data, I should like briefly to describe a method which I have used during the last four and a half years, which has reduced the incidence of fatal postoperative pulmonary emboli. In 1927 a preliminary report was published and later this year a detailed report covering a sufficient number of cases to justify deductions will be made. A method aimed to prevent decrease in metabolism, and in blood pressure and blood flow, which takes place subsequent to operation is of primary importance. The various changes that bring about this condition are: (1) rest in bed without food; (2) interference with abdominal circulation by intra-abdominal manipulation, as splinting of the muscles of the abdominal wall by an incision, and (3) increasing the blood content of fibrin by cutting and handling of tissues. A method that is directed toward combating these features would consist,

33. Homans, John: Thrombophlebitis of the Lower Extremities, Ann. Surg. **87**: 641 (May) 1928.
34. Homans, John: Experimental Thrombophlebitis and Lymphatic Obstruction of the Lower Limb, Arch. Surg. **18**: 992 (April) 1929.
35. Welch: Papers and Addresses, Johns Hopkins Press **1**: 47, 1900.

therefore, of increasing basal metabolism, and increasing blood pressure and blood flow. The increase in basal metabolism can be effectively brought about by giving thyroid extract in 2 grain (0.13 Gm.) doses three times a day, begun as soon as the patient can take fluids by mouth and continued until the tenth day, or not so long should undue elevation of metabolism occur. This, too, increases blood pressure and blood flow. Additional measures of value are early movement of the patient in bed, especially the extremities, as suggested by Wilson and Pool. This method used in a large group of cases showed marked reduction in the incidence of postoperative pulmonary emboli (one case in 4,500 cases). The only patient in this group who received thyroid extract and died of a fatal pulmonary embolus was a woman, aged 54, in whom excision of a duodenal ulcer and gastroduodenostomy was done. She died on the sixth day after operation. Because of the fact that she had auricular fibrillation, she received only 4 grains (0.26 Gm.) of the desiccated thyroid gland. The decrease in metabolism, in circulation and in blood pressure are important factors in setting the stage for postoperative pulmonary embolism, and any method directed toward the prevention or, better still, the compensation of these factors is worthy of trial.

DR. E. W. ROCKEY, Portland, Ore.: The authors' experimental work with cats and their failure to produce thrombosis suggests the great value of keeping the circulation intact after operation as a means of prevention. Dr. Walters' suggestion of the use of thyroid extract in increasing metabolism and the circulation is likewise of great value.

GASTRIC CANCER

A CLINICAL AND ROENTGENOLOGIC STUDY OF ONE HUNDRED CASES *

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The problem of cancer becomes of more interest daily, both to the profession and to the public at large. The stomach has the distinction of being affected more frequently with carcinoma than any other organ of the body. Cancer of the stomach is not often cured. The disease can be removed and recurrence prevented only by surgical treatment. The problem here is the same as cancer elsewhere, to discover the earliest signs and symptoms whereby the patient may be afforded the only possible chance for a cure, an early resection. This fact is well known, yet how seldom does one see an early gastric carcinoma?

A few years ago we reviewed the literature and our group of cases and noted at that time that little had been added in the last decade from the diagnostic side except by the radiologist. The study of the present series brings out the same conclusion. In a recent study [1] of 3,000 consecutive histories of patients having a gastro-intestinal examination, 450, or 15 per cent, received a diagnosis of organic gastric lesions. These 450 diagnoses comprise 295 duodenal ulcers, ninety-two gastric cancers, fifty-seven gastric ulcers, two cases of gastric syphilis, three cases of benign gastric tumors, and one gastric hairball. This review showed that 3.6 per cent of patients complaining of stomach symptoms have gastric cancer. The three most common lesions of the stomach and duodenum bear approximately the following ratio: gastric ulcer 1, gastric cancer 2 and duodenal ulcer 5.

These hundred cases of gastric cancer we believe have been carefully reviewed, and, although nothing particularly new has been brought out, we feel justified in reemphasizing some important facts concerning such a relatively common condition, the incidence of which is apparently on the increase.

The symptomatalogy of gastric carcinoma has been described too often to need more than brief mention. The constant discomfort, food distress, distaste for food, loss of weight, nausea and vomiting, hematemesis and anemia are all relatively late symptoms of the disease. They are clinically important but do not often bring the patient in for examination early enough to allow successful palliative or curative surgery.

We have reviewed in detail our clinical histories to determine the earliest symptoms of the disease noted by the patients. Localized gastric symptoms described as distress, pain, soreness or pressure have been the first symptoms noted in two thirds of all our cases. Vomiting (8 per cent) or loss of appetite (7 per cent) were the initial symptoms in 15 per cent more. In one fifth of all cases the early symptoms were not referred by the patient to his stomach. Loss of weight and strength were noted as the earliest symptoms in five instances. Dysphagia was the first symptom noted in two cases, and diarrhea in one case. A few patients were unable to recall their first symptoms, or we failed to note them.

Loss of weight is not often considered by the patient as of serious significance. Three fourths of our patients had lost more than 20 pounds (9 Kg.) before coming for examination, and many had lost enormously. The weight loss of seventy-nine patients about whom we have accurate figures totaled considerably more than a ton, or neary 30 pounds (14 Kg.) per patient. Only two patients remembered weight loss as the first symptom, and only twenty considered it a prominent symptom.

Nausea and vomiting was a prominent symptom in more than half of all patients. Hematemesis was considered of major importance by only two patients, and recorded in only eleven histories. Nausea, vomiting and hematemesis are not common early symptoms, but are noteworthy symptoms in more than half of all patients by the time they come in for examination.

Loss of strength and loss of appetite are not common early symptoms but have been prominent symptoms in about one third of the patients by the time the history was written.

A gastric mass was complained of by the patient in only six instances, yet forty-one had a palpable mass present.

Any detailed study of the histories of patients suffering from gastric cancer rapidly brings out two distinct groups. The larger group does not give any history of stomach disturbances prior to the onset of the symptoms of cancer or the present complaint; while each case of the smaller group gives a history of long-continued gastric disturbances prior to the onset of the present symptoms.

The larger group of cases gives a history of an onset of symptoms so insidious that it is difficult to recognize the exact beginning. Yet the beginning is not remote and the progress of the disease has been rapid. Such patients usually state that there has not been any trouble with their digestion and that they have enjoyed vigorous health. Their present increasing gastric symptoms have averaged only eight months. Examination

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* From the Mason Clinic.

* Read before the Section on Gastro-Enterology and Proctology at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

1. Dwyer, M. F., and Blackford, J. M.: Interpretation of Gastric Symptoms: A Clinical and Roentgenologic Study of 3,000 Cases, read before the Radiological Society of North America, Chicago, Dec. 3, 1928.

of these patients shows with a remarkable uniformity a total lack of free hydrochloric acid and a large filling defect. It is interesting to note that the filling defect is less often in the pyloric region (44 per cent) than in the upper portions of the stomach (56 per cent). Such cases include two thirds of all patients suffering from gastric carcinoma. In our series, 62 per cent of all cases come into this group; they had not had any gastric symptoms preceding the beginning of their presented complaints; and in only two instances was even a trace of free hydrochloric acid discovered. Thirty-seven patients in this group who had gastric analyses recorded and in whom the original site of the growth could be located with reasonable certainty presented sixteen pyloric lesions, fifteen body lesions and six cardiac lesions.

The smaller group of cases gives a striking contrast in having a longer early history of gastric disturbances. The history of dyspepsia runs back over an average of ten years before the onset of the symptoms of cancer. The old history may suggest chronic cholecystitis, a functional type of hyperacidity, or other gastric disturbance, or a more or less typical syndrome of gastric ulcer. Approximately one third of all cases presented such a history, and these have been carefully reviewed. Gastric analyses (thirty-one cases) have shown that 70 per cent of these show free gastric acid, and occasionally even high gastric acidity. In thirteen instances the histories have been classified as either a story of cholecystits or an irregular gastric history; five of these presented free hydrochloric acid, averaging free hydrochloric acid 10, while free acid was absent in nine. In twelve instances the history has been classified as probable old ulcer, and in every instance analysis has shown free hydrochloric acid averaging 24 degrees. In six cases the history is so typical of gastric ulcer that a tyro should make the diagnosis; each presented free hydrochloric acid, averaging a free hydrochloric acidity of 42 degrees. In studying eighteen patients in this group who had free acid and in whom the original site of the growth could be reported with reasonable accuracy, we find that fifteen originated in the pylorus, three in the pars media and none in the cardiac end of the stomach. Stated differently, eighteen cases in which there were long histories of dyspepsia and later development of gastric cancer with free acid present show 83 per cent pyloric origin and 17 per cent pars media origin, or 100 per cent below the cardia. By contrast, thirty-seven patients with short clinical histories and gastric cancer with achlorhydria show 44 per cent pyloric origin, 39 per cent body origin and 17 per cent cardiac origin, more than half originating above the pyloric region.

Friedenwald [2] reported 100 cases of gastric cancer with gastric analyses in which he agrees with Hartman [3] that free acids are frequently present with gastric carcinoma. Both state that there is no relation between the free acids and the location of the growth, the fractional method of analysis being used. Friedenwald publishes his figures for gastric analysis by both the fractional method and the Ewald meals. Taking his figures for the Ewald meals and gastric analyses, we are not in agreement. He finds 56 per cent, or sixteen cases, compared to 83 per cent in our cases, showing a pyloric location of tumor in the free acid group; and in the achlorhydria group he finds 70 per cent of pyloric location, as compared with our 44 per cent. His number of cases approximates ours, so the difference is not understandable unless it is due to the fact that he attempted to locate the growth in 85 per cent of cases and we in less than 70 per cent.

While we fully recognize that in many apparent cases of achlorhydria there has proved to be free acid if the fractional analysis method is used, we have not felt this method of examination of sufficient additional value to use it as a routine. It has been done at a second examination in doubtful cases and when it seemed that further information from the gastric analysis would shed further light on the case. It is not used in our clinic as the original procedure.

Freeman and Flinn [4] find that free gastric acids are much more common in the ulcer history group of gastric carcinomas, confirming our observations [5] published in 1925.

The anemia of gastric cancer is often noted. We must record that one fourth of our patients had hemoglobin above 70 per cent; i. e., were not anemic. The dehydration of the disease often makes both the hemoglobin and the red cells high and yet the patient may be cachectic and inspissated.

The incidence of gastric cancer in relation to the number of patients examined is interesting. In our general examinations in the clinic the sexes are about evenly divided (male 47 per cent); yet 78 per cent of all gastric cancer cases were found in males. Estimating the number of general examinations, we found the incidence among patients to be approximately one in 115 males and one in 411 females. Taken by decades, the fourth decade shows one in 864; the fifth, one in 230; the sixth, one in thirty, and the seventh, one in thirty-five; 68 per cent of all our cases occurred between the ages of 50 and 70 years.

Regarding the relation of gastric ulcer to gastric cancer, it can only be considered in our study as applied to the cases of cancer with a preulcer history. This includes only one third of all cases. Our clinical and roentgen diagnoses of chronic indurated gastric ulcer are only one-half as frequent as the diagnosis of gastric cancer; but, on the other hand, chronic gastric ulcers are diagnosed about twice as frequently as malignant ulcers. Further, we find it often impossible to differentiate by roentgenographic observations a chronic inflammatory gastric ulcer from a malignant ulcer. We lean strongly to the belief that a definite portion of chronic indurated ulcers are, or later become, malignant.

Unquestionably the outstanding advancement in the diagnosis of cancer of the stomach within the past fifteen years can be attributed to the intelligent use of the roentgen ray. The roentgenologic examination of the stomach if properly done will diagnose or exclude more gastric carcinomas than any other known method. We know of only three positive or negative errors in this series. It is needless to stress the importance of a careful roentgenologic study of every adult patient who consults a physician on account of gastric disturbances, especially if this disturbance has occurred in a previously healthy man.

There is no intent whatever to suggest that the roentgenologic examination be made with the exclusion of other clinical data. On the contrary, if the roentgenologist is not intimately associated with clinicians he

2. Friedenwald, Julius; and Bryan, W. J.: Presence of Free Hydrochloric Acid in Gastric Contents in Carcinoma of Stomach, J. A. M. A. **83**: 265 (July 26) 1924.
3. Hartman, H. R.: Am. J. M. Sc. **163**: 186 (Feb.) 1922.
4. Freeman, E. B., and Flinn, L. B.: Tr. Am. Gastroenterol. A., 1925.
5. Blackford, J. M.: Gastric Carcinoma, Emphasizing Hyperacidity with Ulcer History: A Study of Fifty-Eight Cases, Northwest Med. **24**: 280 (June) 1925.

must acquaint himself with all the clinical facts. "Roentgen diagnosis" has often been stated to be "the subjective interpretation of objective findings"; therefore, in order that the roentgenologist may make an accurate interpretation of the roentgen examination he must logically correlate the objective evidence with all available clinical data. A benign gastric tumor may simulate the filling defect of cancer; syphilis of the stomach has been diagnosed as inoperable carcinoma, and gastrospasm is at times difficult on a single examination to differentiate from an organic gastric lesion.

The roentgen signs of gastric cancer are well known to all roentgenologists. The filling defect is the basic sign and is indispensable to a positive diagnosis. This filling defect, unfortunately, is easy to recognize in the majority of cases, because 50 per cent of gastric carcinomas are inoperable at the time of diagnosis.

Filling defects may be produced by many conditions other than cancer, such as food in the stomach, benign tumors of various nature, hair ball, and spinal pressure. Extrinsic gastric conditions may alter the stomach contour, chief among which are perigastric inflammations, tumors of adjacent organs, and gastrospasm. The experienced roentgenologist by careful palpation, reexamination and the aid of antispasmodics can practically always differentiate deformities caused by an extrinsic cause from those caused by an organic gastric lesion.

A benign gastric tumor may produce a filling defect indistinguishable from cancer. Unless the roentgenologist is familiar with the clinical aspects of the case he cannot in many instances, from the roentgen evidence alone, make a differential diagnosis. It is well for the roentgenologist not to be too hasty in reporting all large filling defects as due to inoperable carcinoma, even though 95 per cent of gastric tumors are cancer. Within the past year we had occasion to examine a man who, from the roentgen evidence alone, was considered to have an inoperable carcinoma. After careful correlation of all observations, an exploratory operation was done and a large fibromyoma was removed.

SUMMARY

1. Of 3,000 patients complaining of gastric symptoms, 3.6 per cent had cancer of the stomach.

2. Sixty-two per cent of the patients with gastric cancer described their earliest symptoms as pain, soreness or pressure, and 15 per cent vomiting or loss of appetite; 23 per cent did not believe that the stomach was the cause of their illness.

3. Seventy-five patients lost more than 20 pounds (9 Kg.) each before coming for examination, yet only two remembered loss of weight as an early symptom and only twenty considered it a prominent symptom.

4. A gastric mass was complained of by the patient in only six instances, though forty-one had a palpable mass present.

5. Sixty-two per cent did not give a history of stomach trouble prior to the onset of the cancer symptoms, yet this onset is so insidious that it is difficult to recognize the exact beginning. The average duration of their complaint was eight months.

6. The examination of the group of gastric cancer patients presenting short histories showed with a remarkable uniformity a total lack of free hydrochloric acid and definite roentgen evidence of large filling defects.

7. The smaller group, comprising 38 per cent of the series, gives a striking contrast in having an early history of much longer duration. They gave histories of gastric disturbances averaging ten years before the onset of the symptoms of cancer.

8. Seventy per cent of the smaller group have free hydrochloric acid present, some in excess of the normal.

9. Eighty-three per cent of the patients presenting long histories and the presence of free acid had the tumor located in the pyloric region, compared with 44 per cent of the group with short histories and absent free acid.

10. Proper interpretation of the roentgenologic examination of the stomach is the most important factor in the diagnosis or exclusion of gastric cancer. The objective observation, however, must always be correlated with the clinical data, as other conditions may simulate the filling defects of cancer.

ABSTRACT OF DISCUSSION

DR. MAX EINHORN, New York: I agree with the authors in almost all instances except one, which means that my experience varies a little. Among their patients, they said, about 62 or 63 per cent of those who had a long-standing history of disease developed cancer. While in my experience I have seen cases with long-standing histories in which cancer developed, I thought it was a rare condition. Among my patients I should say that about one in twenty-five or one in fifteen with chronic ulcer develop cancer, not much more. I think this point of difference may be explained, perhaps, by the way in which the digestive troubles simulate a great many complaints of gastric disturbances and gallbladder conditions, without any reference to the disease. That is again a different point. I mean that all kinds of invalids can also ultimately develop cancerous conditions. The authors brought out another point; namely, that sometimes there can be defects in the stomach or a tumor in the stomach, with all the symptoms indicating malignancy, and still it will be nonmalignant.

DR. TATE MILLER, Dallas, Texas: For ten years I have followed the practice of advising every patient with roentgen diagnosis of cancer of the stomach to have an exploratory operation, regardless of the extensiveness of the involvement, if there is not a palpable mass, if the involvement is not in the cardiac end of the stomach and if there is no discoverable metastasis. This custom, I am sure, has led me to advise a number of unnecessary exploratory operations in patients who were already doomed. There have been three cases, though, in which the diagnosis was erroneous and, since I am one of those gastro-enterologists who do their own roentgen work, there is no one to blame but myself. I have found one case with multiple polyps that I had called cancer, one case of pancreatic cyst with extensive adhesions that had appeared to be a cancer to me, and one case of some gallbladder involvement that had deformed the stomach to such a degree that I called it cancer. In all of the cases there was absence of hydrochloric acid and the usual malignant symptoms were present. These three cases, according to usual custom, would have been called inoperable. While this practice is hard on the patients with really inoperable cancers, it helped a few to live. The others did not have much chance anyhow. Of course, we always make a Wassermann test. In any patient with inoperable malignant disease that I send back home, I explain to the family that, with hope that I am absolutely wrong, I am prescribing some medicine. That medicine is always mixed treatment. There are two patients living now, one that I had diagnosed as having carcinoma of the esophagus and one, carcinoma of the stomach, as a result of that treatment, but I have made many take a lot of unnecessary mixed treatment. I think the two practices are worth while.

DR. M. F. DWYER, Seattle: In regard to the relative frequency of benign and malignant gastric ulcer, we do not attempt to differentiate clinically or roentgenologically a benign from a malignant ulcer, but advise all patients with a gastric ulcer to be operated on. If I had a gastric ulcer I know I would feel more at ease in seeing it in a bottle in the laboratory than

to know that I was carrying it about in my stomach. The diagnosis of nonmalignant gastric tumors was mentioned in the discussion. It is well to remember that 95 per cent of gastric tumors are malignant, and that there must be careful correlation of all clinical and roentgenologic data before a diagnosis of benign gastric tumor is attempted. The patient should always be given the benefit of the doubt. Recently we had a case which from a roentgenologic standpoint appeared to be a cancer. Operation showed the tumor to be a fibromyoma. Benign gastric tumors may occasionally not give stomach symptoms. We had a man consult us on account of marked diarrhea of seven years' standing. Roentgenologic examination showed three polyps on the posterior gastric wall, the removal of which stopped the diarrhea. We followed the patient for two years after the operation and during that time the diarrhea did not recur. It is well, however, in diagnosing gastric tumors not to be too prone to consider the unusual or benign tumors, for they comprise less than 0.5 per cent of gastric tumors. The roentgenologist is of great assistance in determining the operability of a given case of gastric cancer. He must, however, be familiar with the surgical skill of the surgeon who is to do the resection. What may be operable for one surgeon may be inoperable for another.

IMMUNIZATION AGAINST TUBERCULOSIS BY BACILLUS CALMETTE-GUÉRIN (B C G) *

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The decline in the death rate from tuberculosis in the registration states of the United States from nearly 200 per hundred thousand living to less than 80 during the year period 1900 to 1928 has led such statisticians as Dublin [1] to predict that this disease may almost disappear in our lifetime. Others are not as sanguine and they also point out that while the death rate is steadily and surely decreasing in the white races there is an increase in the death rate from tuberculosis in the negroes and Mexicans, especially in those who are crowding into the northern cities. More than 75,000 beds are now available in this country for the tuberculous, and upward of 150,000 patients are so cared for and isolated more or less from the community. Koch,[2] more than twenty-five years ago, believed that segregation of the tuberculous would achieve for tuberculosis what segregation of the lepers had accomplished in the elimination of leprosy. With the isolation of tuberculous carriers and with the pasteurization of milk it was expected that the race would become more vulnerable to tuberculosis and that in the absence of the mild early infections many would succumb to the acute type of tuberculosis which carries off primitive people. This prediction has not come to pass. The tuberculin skin tests have shown that in Vienna [3] 94 per cent of children up to the age of 12 are infected with tubercle bacilli, whereas in a city such as St. Louis [4] only 44 per cent react at the same age. In rural districts in this country the percentage of children who react to the skin tuberculin test is extremely low. Many young adults who have missed the primary infection of childhood must therefore sooner or later be exposed to tubercle bacilli and become infected. One should expect to find in many young adults manifestations such as slight fever, weight loss, irritability and anemia, signs which are found in children with first infection. As a matter of experience one does not find so many young adults presenting these signs, and one does not find many with the acute type that the Senegalese troops developed in France. Such observations suggest that our race has now a higher resistance to tuberculosis than formerly, probably the result of the perishing of so many generations of those more susceptible.

It is at such a moment that the avirulent living tubercle bacilli of Calmette,[5] termed B C G, or bacillus Calmette-Guérin, are offered for preventive vaccination. The organism constituting B C G was isolated by Calmette in 1908. A virulent bovine tubercle bacillus was cultivated on glycerinated potato bile medium. Periodic transplants were made and virulence was diminished for laboratory animals and cattle so that in 1921 Calmette suggested that an emulsion of this culture be fed to infants as a prophylactic measure against tuberculosis. Up to date some 120,000 infants have been treated in France, and Calmette asserts that the tuberculosis mortality in these children has been reduced by more than three fourths.

Last year a commission [6] to investigate B C G was appointed by the health committee of the League of Nations. In October, 1928, this commission heard reports from three committees which had been named. The bacteriologic committee headed by Bordet reported that B C G was a harmless vaccine and that laboratory animals did not develop progressive tuberculosis following inoculation. Among other matters the committee wished to determine methods to preserve the characteristic properties of B C G, to determine the results of successive passages in animals, and to determine the experimental dosage of B C G and of the virulent bacilli used to test the protective results.

The bacteriologic committee also advised that studies in dissociation properties and comparative studies in histologic changes by B C G and virulent organisms should be carried further. The clinical committee with Leon Bernard as chairman reported favorably as to the harmlessness of the vaccine and that a certain degree of protection resulted from the use of B C G. The committee of veterinarians reported favorably on the use of B C G for the vaccination of cattle.

Numerous publications have appeared in recent years concerning B C G, and many of these have been admirably reviewed by Petroff.[7] Practically all investigators in the production of immunity to tuberculosis have been of the same opinion; namely, that the use of the living organism was necessary and that the inoculation of dead bacilli in experimental animals yielded little or no immunity. Some years ago I undertook a few crucial experiments in this regard which more recent experiments would appear to corroborate. An emulsion of dead bacilli was injected subcutaneously into guinea-pigs, and after a few weeks a local cold abscess developed. The pus from such an abscess was aspirated, and into the cavity resulting a small number of living

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* Read before the Section on Practice of Medicine at the Eighteth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

1. Dublin, L. I.: The Conquest of Tuberculosis, Harper's, April, 1929.
2. Koch, Robert: Nobel Lecture, Lancet **2:** 442, 1903.
3. Hamburger, F., and Monti, R.: München. med. Wchnschr. **56:** 449, 1909.
4. Veeder, B. S., and Johnston, M. R.: The Frequency of Infection with the Tubercle Bacillus in Childhood, Am. J. Dis. Child. **9:** 478 (June) 1915.
5. Calmette, A.: Prémunition des nouveau-nés contre la tuberculose par le vaccin B C G, Ann. de l'Inst. Pasteur **40:** 89 (Feb.) 1926.
6. Report of the Technical Commission for the Study of Tuberculosis Vaccination by Means of B C G, Bulletin of the International Union Against Tuberculosis **6,** number 2, 1929.
7. Petroff, S. A., and Branch, Arnold: Bacillus Calmette-Guérin: An Analysis and Critical Review, Am. J. Pub. Health **18:** 843 (July) 1928.

tubercle bacilli from the original culture were injected. It might be expected that the abscess wall of tuberculous tissue would have sufficient local immunity to protect the animal from the small number of living bacilli inserted. This, however, was not the case and tuberculosis spread through the guinea-pigs as rapidly as through the controls.

The objection has been raised to B C G that the avirulent organism might become virulent after long residence in the human body. I have some data in connection with the use of a human tubercle culture of diminished virulence, of which 120 bacilli were necessary to infect a guinea-pig when only ten bacilli, or less, of virulent cultures were found necessary.

In 1909,[8] five children were inoculated at weekly intervals with increasing numbers of this attenuated human culture, beginning with one organism until a total of five times the infecting dose for guinea-pigs had been inoculated. After twenty years these children are grown men and women with no trace of tuberculosis. In one of the families a child which was not inoculated developed a tubercle bone lesion.

Petroff attempted to increase the virulence of B C G by rapid animal passage. From 1 to 2.5 mg. of the B C G culture was inoculated into the right testicle of two guinea-pigs. The infected testicles were carefully removed after seven to fourteen days and the triturated tissues were reinoculated into the right testicle of two other animals. Four such series were carried out and three of the four gave negative results, after the third, fourth and fifth passages. In one series the guinea-pig of the second passage developed generalized tuberculosis. One must remember that guinea-pigs may develop spontaneous tuberculosis and that it is very necessary to work as Calmette does in laboratories and surroundings which are entirely free from virulent cultures. I have repeated these experiments of Petroff with negative results. It is not possible in this paper to review all the animal experiments which have been conducted with B C G. Petroff agrees that the results of Wilbert[9] in immunizing monkeys, if they can be repeated, will strengthen the status of B C G vaccination. Kraus and Gerlach[10] have already done so. I have seen the work of Meyer in San Francisco, who for several years has immunized *Macacus rhesus* monkeys with B C G. These monkeys are kept indoors and used for experiments with poliomyelitis. Formerly a number developed tuberculosis and died. Meyer has found that should the monkeys arrive with tuberculosis, the subcutaneous inoculation of B C G causes death in a short time. Since the employment of B C G, all monkeys have remained free from tuberculosis and those that have been killed in other experiments have not shown any trace of tuberculosis.

Watson[11] in Canada has not been able to substantiate Calmette and Guérin in regard to the value of B C G vaccination of calves if these animals are not separated from contaminated surroundings for thirty days. King and Park[12] have found progressive tuberculosis in one guinea-pig after subcutaneous inoculation. Testing vaccinated animals by the inoculation of virulent tubercle bacilli, they found that they developed less tuberculosis than the controls. Haring, Traum, Hayes and Henry of the College of Agriculture, University of California, find that B C G is harmless to various animals and that some immunity is produced by it. They do not justify its use on cattle when other measures to eradicate tuberculosis are being carried out. Petroff has been able to separate B C G into rough and smooth colonies and has found the smooth colonies of greater virulence. Such dissociation has been observed with many bacteria. He concludes that Calmette, by continuous subcultures, has eliminated most of the smooth colony type and that in B C G the rough colony, or attenuated type, predominates. Kraus[13] also obtained rough and smooth colonies from B C G but found that both were nonpathogenic. Tzekhnovitzer,[14] at the Paris conference last October, stated that he had not been able to dissociate pathogenic organisms. Up to 1927, Weill-Hallé and Turpin[15] in Paris had reported 469 children vaccinated with B C G. During visits to the Charité Hospital, I saw a number of these children. A few had been inoculated subcutaneously with the formation of local abscesses which had been aspirated and had then healed. The children were in excellent health and the death rate of those exposed in a tuberculous family had markedly decreased. On account of the protection weakening after eighteen months, some fifty-nine children had been revaccinated without harm. Experience had shown that the infant should be separated from a tuberculous mother or family for a few weeks after birth during the period of immunization. While in this country a few infants exposed to tuberculous mothers have been given B C G by Opie and one infant by myself, Park[16] of the New York Health Department has given B C G to 167 infants in tuberculous families. At the same time Park has observed 280 infants born in tuberculous families as controls. In the latter the death rate from tuberculosis has been 8.6 per cent, whereas in the vaccinated children the tuberculosis mortality has been only 1.2 per cent. The nontuberculosis mortality has been 6.4 per cent in the controls and 6.6 per cent in the vaccinated. The latter observation does not agree with the reports of other workers with B C G, who have stated that in children vaccinated with B C G the general mortality is also decreased.

Of children exposed to positive sputum, 20.1 per cent of the controls have died of tuberculosis whereas in the vaccinated 12 per cent have died from this disease. In children not exposed to positive sputum, 2.6 per cent have died from tuberculosis but in the vaccinated none have died. Park has also inoculated ten infants with 0.1 mg. of B C G intradermally without any bad results. While no conclusions can be safely drawn from the figures of Park, the results would appear to confirm the favorable reports of European observers.

Children in tuberculous surroundings are easily infected with tuberculosis, and 1 year old infants may yield 70 per cent positive tuberculin tests. The percentages probably vary according to whether the mother or the father has positive sputum. An infant cared for by a mother with positive sputum certainly has little chance of escaping tuberculosis. In crowded dwellings

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9. Wilbert, J.: Ann. de l'Inst. Pasteur **39**: 641 (Aug.) 1925.
10. Kraus and Gerlach, cited by Calmette: Ann. de l'Inst. Pasteur **42**: 6 (Jan.) 1928.
11. Watson, E. A.: Researches on Bacillus Calmette-Guérin and Experimental Vaccination Against Bovine Tuberculosis, J. Am. Vet. M. A. **73**: 7, 1928.
12. King, M. J., and Park, W. H.: Effect of Calmette's B C G Vaccine on Experimental Animals, Am. J. Pub. Health **19**: 179 (Feb.) 1929.
13. Kraus, R.: Ueber die Dissociation des B C G Stammes nach Petroff, Ztschr. f. Immunitätsforsch. u. exper. Therap. **61**: 454, 1929.
14. Tzekhnovitzer, M.: Ann. de l'Inst. Pasteur **42**: 246 (March) 1928.
15. Weill-Hallé, B., and Turpin, R.: Ann. de l'Inst. Pasteur **41**: 3, 1927.
16. Park, W. H.: Personal communication to the author, June, 1929.

an open case of pulmonary tuberculosis may lead to active disease in many who have been exposed. Among persons with means above the average, tuberculosis is a family disease and in spite of good food and surroundings a tuberculous parent will often infect the family and some of the children will develop active tuberculosis.

The present method advised by Calmette is to feed infants on the third, fifth and seventh days after birth with 2 cc. of B C G suspension, representing 10 mg. moist weight of bacilli. Each feeding would contain approximately four hundred million bacilli. Calmette advocates vaccination with B C G immediately after birth before there has been any possibility of virulent infection. For this reason and because the discovery of B C G is so recent there is as yet no information on the question whether the vaccination has any effect in preventing adult tuberculosis.

Some of the favorable reports emanating from Calmette and his co-workers have been severely criticized by statisticians on the ground of inadequate control. On the other hand it is a conspicuous fact that practically all independent reports coming from different countries have been favorable to the use of B C G.

I am of the opinion after careful study of the literature and after personal investigations and experiments that B C G should be administered to infants born to parents with open pulmonary tuberculosis. With further proof of the harmlessness and efficiency of the vaccine it may be found that all new-born infants should be vaccinated against tuberculosis with B C G.

402 Burns Building.

ABSTRACT OF DISCUSSION

DR. C. M. POTTENGER, Monrovia, Calif.: It means something to have a man of Dr. Webb's experience endorse B C G. Dr. Webb has been engaged in attempts at immunization for many years. I have always considered that his experiment in injecting an animal with an individual bacillus and then increasing the number until it was able to withstand large numbers was a real advance in our work on immunity. Immunity in tuberculosis is only relative. It has been known that resistance to infection may be raised by the artificial injection of living bacilli since the time of Koch. Man gains a resistance to tuberculosis through small primary infections, many of which take place during the early years of childhood. Children who are obliged to live in a tuberculous environment are infected with larger numbers of bacilli, and thus become more prone to develop an active disease. For several years the Grancher Society in France has farmed out among the peasants those children who were born in families with open tuberculosis. This has proved to be a satisfactory way of preventing infection but has required the removing of the child from its home. Calmette's efforts have been to secure a vaccination for these children so that they could live safely in an infected environment. His method of vaccination is to give, by mouth, three doses of 400,000,000 avirulent tubercle bacilli during the first week of their lives, the first dose within twenty-four hours after birth. He depends on the increased penetrability of the mucous membranes during the early days of life for sufficient absorption to take place to grant immunity. There are two questions of particular interest. First, will B C G grant immunity? Statisticians differ; but the statistics of a sufficient number of careful observers are at hand to show that there does seem to be some protection. Granting that it is of only 5, 10, 15 or 20 per cent, it would be of tremendous value to these children. The next question is whether or not B C G will produce tuberculosis. On this, too, authorities differ. Should these bacilli take on virulence occasionally, it probably would not be so great as the virulence of the bacilli that would enter their bodies by natural infection. Danger from it so far seems to be unproved. Its exact status cannot yet be determined, but I am convinced that it is sufficiently harmless to use when the danger is so great as in the case of children born in a tuberculous environment. Whether it can be used in adults or not is an entirely different problem.

DR. RALPH C. MATSON, Portland, Ore.: Theoretically the method proposed by Calmette is logical. However, regarding the value and safety of the procedure, probably no phase of the tuberculosis question is the object of greater discussion. Most of the reports on the method of vaccination confirm Calmette's claims—some of them with an enthusiasm which seems scarcely justifiable after careful analysis of the statistics presented. Before adopting wholesale vaccination with living organisms, it must be established definitely that the method is not dangerous and is effective. At the present time, the spirit of controversy is being aroused regarding the tuberculogenic properties of B C G. In Calmette's earlier publications, he says that no tuberculous changes were produced in guinea-pigs. In his later publications, he admits that tuberculous changes can be produced in guinea-pigs, but adds that they completely heal and that no progressive disease was observed. Calmette's statements were supported by many workers. Contrary claims have been made by equally capable investigators who not only have observed definite tuberculous changes in guinea-pigs inoculated with B C G but have been able to pass the disease from animal to animal and by such passage to increase its virulence. Among the latter group of investigators I would mention Loewenstein, Abderhalden, Watson, Kirsten and Petroff. Petroff has very clearly shown in his study of the four cultures of B C G which he obtained from Calmette that every one of them contained organisms which were capable of producing tuberculous changes in guinea-pigs, some of which were progressive. Petroff's observations have been confirmed recently by Korschaun. The vaccinated animals, according to Korschaun's experiments, live scarcely longer, or only a little longer, than the control animals. Watson of Ottawa has concluded after very extensive study of B C G that there is no evidence even suggesting that B C G vaccinated animals have any different type of tuberculosis than the unvaccinated animals. Recently, Larsen and Evans corroborated Watson's conclusions. The statistics on which Calmette's opinion has been largely based are also open to severe criticism. Statements have been made from careful analyses of these statistics that first of all there is a lack of clinical evidence in vaccinated children and in the children not vaccinated. Three cases have been reported in the literature in which there is a possibility that infection and progressive changes were due to the increased virulence of B C G. From a study of the statistics, one is forced to conclude that it is not yet established that B C G is harmless, and the statistics which appear to stress its value are also open to criticism. It would seem that we should go slowly until we have more evidence that the vaccine is harmless and that its value has been proved.

DR. GERALD B. WEBB, Colorado Springs, Colo.: We do not know yet what this vaccine will do for adults. We cannot give it to adults, and these infants have not yet arrived even at adolescence, so we cannot forecast how good this method will be in the prevention of tuberculosis among the adults when they, as infants, had received vaccination. Time will tell. The criticism of Calmette and, I think, the criticisms of the statistics are perfectly correct, as Dr. Matson has said. But, on the other hand, the reports from all countries, from Rochester to Spain, and so on, all speak as to the harmlessness of the vaccine, and they always endorse somewhat its efficiency. Petroff acknowledges that the virulent part of this vaccine, that is, the smooth part, is very little in evidence, and that the harmless part, that is, the rough part of it, much overgrows the other part of the vaccine. I think the conclusions of Dr. Matson are exactly the same as the conclusions I have given. That is to say, that we are not yet ready, until its complete harmlessness and its efficiency are shown, to use this vaccine in all new-born infants. I do think that there is a sphere of usefulness for it in infants born of a tuberculous mother or of a tuberculous father. Granting that there is some slight danger in this vaccine, it is as nothing compared to the danger to which an infant is exposed if the infant has a tuberculous mother.

THE BIOCHEMICAL ACTION OF DIGITALIS *

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Today we are still insufficiently informed, experimentally as well as clinically, about the action of digitalis. This is by no means due to any scarcity of research in this field. On the contrary, there is hardly a drug that has been so fully investigated. That we know so little about digitalis, in spite of all this research, is due partly to the fact that we often use, in these experiments, the ordinary tinctures, extracts and infusions. Such preparations contain a multiplicity of substances, both active and inactive, which influence each other's solubility and pharmacologic action, giving an equation with many unknown factors. The large number of these unknown items no doubt accounts for the great discrepancies which one finds continually in the literature about the action of digitalis.

The following is a schematic analysis of folia digitalis:

Similarly to digitoxin, the other two glucosides also can be split up into digitoxose, the sugar component, and a sugar-free component or "aglykon."

FACTORS CONCERNED IN ACTION OF DIGITALIS

The chief factors of digitalis action are the glucosides, of which the three mentioned have been more thoroughly investigated during the last few years. As just stated, the digitalis glucosides are composed of digitoxose, which is common to all three and is the inert constituent, and of the so-called aglykon, which produces a weaker heart action than the glucosides, though a distinctly noticeable one. Each of the three glucosides has its specific "aglykon," which is the component from which the glucoside receives the character of its pharmacologic action. These bodies, therefore, are being called "genins." Consequently, each of the three glucosides contains a characteristic genin which, when combined with the sugar, produces the action of the glucoside. Side by side with the glucosides, the genins are found in the leaves in a preformed state.

Aside from the active components, one also finds inactive substances in the leaves, such as salts and saponins. Among the salts, the main constituent is potassium, which counteracts the activity of the glucosides and their genins in extracts made from the leaves. On the other hand, there are the saponins, which may be considered as accelerators of the glucosidal action. Thus, according to its potassium content, its saponin content, and again according to its different quantitative and qualitative glucosidal composition, the action of digitalis will vary widely. This explains the contradictions found in the literature on digitalis.

By studying the actions of the isolated individual substances, I have attempted, therefore, to arrive at what might be called a synthetic picture of digitalis action, instead of the usual analytic procedure. I have studied the pharmocology of each component separately and this enabled me to estimate the activities of the total group. To this end, I prepared in purest form specimens of digitoxin, digitoxigenin, bigitalin, bigitaligenin, gitalin and gitaligenin and, also the latest split product, digitoxose. If one could visualize the difficulties encountered in the isolation of such complex bodies as the glucosides from the greenish-black extract of digitalis, one would realize what an achievement it was to obtain these substances at all.

I then tested the individual components both separately and in combination, and also the varying changes in action brought about by the association of the glucosides with the inert portions of the potassium and saponin groups. Thus, I finally reached a better picture of the total action of digitalis.

MECHANISM OF CARDIAC RESPONSE

To appreciate the effects of digitalis, it is best to obtain a clear understanding of how the pathologic heart differs from the normal. The investigations of Frank are most helpful in this endeavor. It was he who first showed that the contraction of the cardiac muscle runs parallel to the load tension of skeletal muscle. When a weight is attached to a skeletal muscle and the load supported so that it does not cause lengthening of the muscle, an electrical stimulus will cause contraction of the muscle and will lift the weight to a certain height. This is called the support-tension of the muscle. If, on the other hand, the weight is allowed to exert its pull, the muscle is slightly lengthened. An electrical stimulus which will now contract the muscle will cause the weight to describe a longer trajectory than before. If we further modify this experiment by continually increasing the weight, without allowing it to exert its pull, until the muscle becomes unable to lift it from the supporting platform, we obtain the maximum support-tension of the muscle. If the platform is now lowered a little, so that the weight again exerts its pull on the muscle, and the latter is contracted by electrical stimulation, it is found that the muscle is able to lift a weight which it was unable to lift before.

O. Frank has demonstrated that the same principles may be applied to cardiac contraction and that the heart muscle must naturally exert a certain amount of force and energy when it contracts around a definite resistance. If this resistance is increased until the normal cardiac muscle is unable to overcome it, then the heart muscle stretches somewhat and through this extra extension overcomes the heightened resistance, just as the skeletal muscle was again able to lift the larger weight. When the point is reached at which the increased resistance almost prevents the heart from accomplishing its work, the muscle dilates and is thus enabled to accomplish a larger volume of work.

It must not be forgotten, however, that the heart is a spherical organ and that it contracts around a fluid content. No sooner does the heart dilate than this fluid mass or resistance increases, thereby partly nullifying the advantage gained by dilatation. Thus, a stage must be reached at which the improvement due to cardiac hypertrophy is overcompensated by the greater load and this is where cardiac insufficiency really begins; the heart has stretched itself beyond its physiologic limits and the signs of insufficiency, such as diminished volume of beats and lessened capacity, begin to appear.

It is these principles on which the investigations of the Utrecht school are based which show that, under

* From a lecture delivered before a group of physicians visiting the author's laboratory in Zurich, Switzerland, Oct. 11, 1928.

the influence of digitalis, the cardiac muscle is capable of overcoming a greater resistance without having to undergo dilatation. In other words, digitalis is capable of changing the heart to such an extent that its physiologic equilibrium becomes less easily disturbed, so that with its normal initial extension the cardiac muscle can handle a larger volume or overcome a greater resistance.

We owe this fundamental explanation of the action of digitalis particularly to the Magnus school. I had previously attempted to explain the situation, though incompletely, by digitalis experiments on intact animals with crippled hearts. At that time, twenty odd years ago, I had no knowledge of the investigations of Magnus and his school. I even began with false premises. It was thought that, because digitalis easily overcomes such resistance, it was capable of producing cardiac hypertrophy. Hence, animals were fed with digitalis for months and the hearts of control animals of the same litter were thoroughly investigated and weighed; but it was found that instead of growing larger and heavier, the hearts became rather smaller under the influence of digitalis. These results, which surprised me at the time, are now understandable, thanks to the investigations of the Utrecht school.

I have further extended these investigations to animals with experimental valvular lesions of the heart, particularly aortic insufficiency, which constitutes a decided additional burden for the left ventricle. The animals that developed a valvular defect underwent, of course, cardiac dilatation and hypertrophy in order to expel the larger volume of blood. I have already discussed the causes of this effect: The heart attempts to overcome the additional work by starting from an increased initial tension. This compensatory trend can be calculated mathematically. While the normal heart of a rabbit weighs 2.5 Gm. for each kilogram of body weight and the digitalized heart 2.3 Gm., the average heart with aortic insufficiency weighs 4.5 Gm., an increase of 80 per cent. But if digitalis is administered to these animals immediately after the aortic defect develops and the treatment is regularly continued, then the dilatation and hypertrophy never reach the high degree attained without digitalis treatment. Only an average of 3.2 Gm. over the normal cardiac weight is obtained, an increase of only 38 per cent.

These smaller weights, however, do not necessarily prove that a functional, i. e., a therapeutic, effect has really been obtained by digitalis medication. But when these aortic-deficient hearts are compared with normal hearts as to their absolute reserve energy, one finds that the crippled, digitalis-treated heart is almost equal to the normal; while the defective heart without digitalis treatment is much more rapidly exhausted. The capacity of the former is nearly double that of the latter, a fact of great importance in practice. This should be sufficient to induce prophylactic treatment with digitalis in all early cases of endocarditis which are apt to terminate in valvular lesions.

Contrary to the former conception, I now consider every heart with dilatation and hypertrophy as in an abnormal state and of diminished efficiency. As a result of experimental investigations, I now understand that a dilated and hypertrophied heart encounters greater difficulties, as the demands on it increase, than the heart of normal size, mainly because it is unable to count on "physiologic" dilatation for overcoming the extra work; its power of adaptation is decreased. Correspondingly, I see in daily practice that a slightly insufficient heart with little compensatory dilatation reduces its size gradually to normal under a few weeks of treatment with digitalis, provided, of course, that the cardiac muscle can still function.

STAGES OF DIGITALIS ACTION

All this points to the fact that in digitalis action we are dealing with muscle effects. The digitalis action may now be analyzed by first asking: How does the specific improvement in cardiac activity take place? In this connection, I shall refer to the results that my associate, Dr. Fischer, and I have obtained within the last few years, in the application of the isolated, pure digitalis substances. I have shown here that the digitalis glucosides are crystalloids, bodies that have the property of passing through a membrane. When digitoxin and the heart are brought together by allowing the former to act on the cardiac muscle through the circulation and coronary arteries, the digitoxin body will eventually have to pass through a membrane. Thus is obtained, at first, the so-called membrane stage, representing the time necessary for the poison to pass through the wall of the muscle cell and come in contact with the tissue. This phase is very short, lasting only a few seconds. It is of particular interest because digitoxin is by far the most active component of digitalis leaves and its action may be considered as almost equal to that of digitalis.

The most interesting point in the membrane stage is its absolute reversibility. During its short duration one can always reobtain the poison by washing it out. As soon, however, as the digitoxin passes through the cell membrane and comes in contact with the muscle, the second phase of digitalis action begins; the fixation stage. During it, a characteristic property of digitoxin, irrevocable fixation, becomes evident. Neither by physiologic nor by chemical means is it possible to extricate digitoxin from the muscle to which it is permanently bound; not even by extraction of the minced cardiac muscle with chloroform. This fixation may therefore be termed irreversible.

It is in this fixation stage that digitalis action becomes apparent; namely, by the functional changes. From the description given here it will be readily understood that the actual change in cardiac action does not take place immediately, as one might be inclined to judge by analogy with other remedies. The fixation stage begins with a latent phase during which no sensible change is elicited; only after a certain period are effects noted that can be graphically registered. These effects, when the dose is large enough, consist in the irreversible tonic standstill of the heart because the poison is not eliminated; or, when the dose is small, in a so-called therapeutic functional change characterized by stronge cardiac contractions. This change lasts from one to twenty-four hours according to the character of the preparation and the condition of the heart.

The question may now be asked: How is it that, on the one hand, the digitoxin is irreversibly fixed in the cardiac muscle, while, on the other, there is a temporary, although long-enduring, effect in the form of a functional change? This apparently contradictory condition is explained by the fact that the digitoxin after fixation is split by the living protoplasm into its genin and sugar. The genins are cardiotonic substances, and this is contrary to the former opinion that only the unsplit total glucosides are cardio-active. In fact, digitoxigenin is a more potent toxin than the two glucosides, bigitalin and gitalin; hence, digitoxigenin is

capable of continuing the specific heart action of digitoxin after the latter has been split. Moreover, in opposition to the irreversible fixation of the glucosides, the genins are only loosely bound to the muscle cell, which is thus enabled to free itself from the irreversible burden of digitoxin by splitting it. The new substance, digitoxigenin, is still active, but, not being permanently fixed, it is gradually eliminated so that the digitoxin action ultimately disappears.

In this connection, mention should be made of another condition: the so-called cumulative action of digitalis. Cumulation of effect can take place only because the glucosides, especially digitoxin, are at first irreversibly fixed as such. Nevertheless, they are broken down slowly and their split products are ultimately removed from the cardiac muscle. If, then, insufficient time is allowed for the complete elimination from the heart of the first dose of the glucoside and its genin, and if a second, third and fourth dose are added, a cumulative effect must necessarily take place.

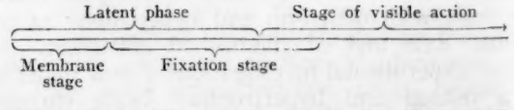
That the genins are actually cardio-active and at the same time not firmly fixed in the heart muscle has been demonstrated not only experimentally but also clinically. A patient under constant digitalis treatment who requires a certain dose of glucosides will usually develop symptoms of cardiac insufficiency if this dose is not administered for a week or two. But if a corresponding quantity of genins is substituted, it is possible to obtain the same therapeutic results as when the glucosidal mixture was given. Owing, however, to the reversibility of the genin fixation, the effect is not so lasting. In this peculiarity of the glucosides, on the one hand, and of their genins, on the other, lies the reason for the cumulative action of the former and the absence of such cumulation from the latter.

Only the functional changes which digitalis is able to produce in the heart have been considered until now. What is the material foundation for these phenomena? What is, in the last analysis, the nature of digitalis action on cardiac muscle? It is evident that digitalis is capable of improving the physiologic capacity of the cardiac muscle. It is known also that the function of the heart depends on its colloidal state, particularly on its hydrophilic phase. It has been observed again and again that the heart of a child which still has a well marked hydrophilic phase is more efficient than the heart of an older person in whom age has heightened the hydrophobic phase. Under the influence of digitalis, the capacity of cardiac muscle for swelling is increased, and the heart is therefore able to contract more strongly and to relax more easily. Correspondingly, patients are seen between 50 and 60 years, beginning to show the first signs of cardiac slackening, who retain for a long time excellent heart function by systematic and constant treatment with digitalis. There are patients who have been under continued digitalis treatment for twenty years who owe to it their ability to work and act like persons with almost normal hearts. As soon as digitalis is discontinued for two weeks, symptoms of cardiac insufficiency make their appearance.

Now, as to the fixation of digitoxin in the cardiac muscle. What kind of process is it? Is it of a chemical or a physical nature? It might be both. As is known, a fiber of vegetal or animal origin can be impregnated with dyes by a purely physical process, and something similar may be the basis of the fixation of digitalis in cardiac muscle. It is, of course, equally possible that we are dealing with a chemical combination. We might be able to decide which one of the two processes applies by ascertaining whether the action of digitoxin follows van't Hoff's law. According to this law a chemical reaction is accelerated by an increase in temperature, while purely physical processes are not hastened thereby. Experiments made in our laboratory by Dr. Fischer have shown that practically all the cardiac functions which are influenced by digitalis were increased exactly according to van't Hoff's values: when the temperature rises, the effect is heightened. The process of fixation and the functional change associated with it is therefore probably a chemical reaction.

One more point must be discussed. I have shown that digitalis does not have an immediate effect but that a latent phase develops during which an effect is not observed. How can this lag-period be explained? It must first be remembered that these glucosides are bodies of high molecular weight, amounting to about 800. The chemical conversion of such large molecular bodies is necessarily slow. Secondly, one must not forget that a certain amount of the active substance must accumulate in the heart before an effect can be elicited. Time must elapse before this amount enters the heart and becomes fixed. That the functional change is dependent on a certain amount of the toxin has been established by the fact that the heart always requires the same amount of digitoxin before the maximum effect, systolic standstill, can take place. This amount corresponds to about 0.0025 mg. of digitoxin per gram of frog's heart. It has also been demonstrated that the heart cannot store more than a definite amount of digitoxin; no matter how much digitoxin may be administered, the heart will not take in any more. There is therefore a limit of absorbability which further speaks for the chemical nature of the reaction. Straub has shown that strophanthin is fixed in the same proportion and when the maximal fixation is reached the cardiac muscle will absorb no more, irrespective of the concentration and amount of the toxin in solution.

To recapitulate, the three stages through which the action of digitalis on the heart must pass are, first, the reversible membrane stage, which lasts about ten seconds and is probably a physical process. Then follows the fixation stage of about four minutes' duration. After the irreversible fixation stage is concluded, the digitoxin can no longer be reobtained. It takes some time before fixation takes place. The second stage, therefore, partially overlaps the third phase, namely, the stage of visible action. The third stage begins as soon as a sufficient number of molecules have become fixed to bring about the first marked functional change. The transformation increases with the fixation of further molecules until the limit of intake is reached. When this limit has been reached, cardiac standstill is irreversible; but if the dose has been small enough to allow the heart to continue beating the cardiac muscle will ultimately free itself from the otherwise indissoluble grip by the splitting of the digitoxin glucoside already mentioned.



THE RELATION OF CALCIUM TO DIGITALIS

Löwi has maintained that the action of digitalis is similar to that of calcium; that there can be no digitalis action without calcium, and that the effects of calcium and of digitalis are to be considered as identical.

Clinically use is made often of this principle by administering lime simultaneously with digitalis in order to enhance the therapeutic effect of the latter. Nevertheless, Löwi's conception does not prove to be entirely correct. In attacking the problem, we must not begin by completely depriving the cardiac muscle of its calcium by allowing oxalic acid, for instance, to act on it and thus precipitate the lime. This would destroy the colloid structure of the heart and injure it to such an extent that it could not react normally any longer. Oxalic acid is such a strong muscle poison that one need not wonder that digitalis fails to have any effect on such an injured heart. The problem can be approached in a less radical way by perfusing the heart with solutions of calcium varying between 0 and supernormal.

When an isolated frog heart is repeatedly perfused with a calcium-free salt solution so that all the lime which does not form an integral part of the muscle fiber is thoroughly removed, or when the heart is perfused with normal Ringer's solution, or when a Ringer's solution is employed the lime content of which is thrice the normal amount and a standardized digitoxin solution is then allowed to exert its action on this heart, no differences whatever are obtained. The various stages of digitoxin action which I have discussed follow each other quantitatively and chronologically in the same manner as if the heart had not undergone any calcium treatment at all.

If the sequence of the experiment is reversed, however, by first allowing digitoxin in a calcium-free Ringer's solution to act on the heart, the normal membrane stage is again obtained, followed by the stage of fixation. If, finally, a Ringer's solution containing the normal or an increased amount of calcium is substituted for the digitoxin solution, at the moment when the heart has already fixed the toxin but has not, as yet, shown any functional change (i. e., during the latent phase), then immediately a tonic contraction of the heart is obtained.

It could be argued that this corroborates Löwi's theory; but the facts point to a different explanation. Considered by itself, there is no doubt that calcium is a cardiac tonic. A Ringer solution containing twenty times the regular amount of lime produces an instantaneous cardiac action, which can be readily abolished by rinsing. The reason we obtained a tonic effect on the heart with ordinary Ringer's solution was that digitalis had sensitized the heart to such a high degree that the difference between the calcium-free Ringer's solution first used, and the calcium-containing solution that followed was a sufficient stimulus to contraction. But this effect cannot be said to be identical with the action of digitalis, because we are able to abolish the tonic contraction instantaneously by rinsing with calcium-free Ringer's solution, thus causing the heart to beat again. Nevertheless, the specific action of digitoxin on such a heart continues its normal course and, after a certain lapse of time, ends in a standstill. The calcium tonus is therefore completely reversible, while the digitoxin effect is just as completely irreversible.

Another important point in this connection is the fact that the sensitization of the heart by digitoxin is not limited to calcium alone. Strontium and barium will also cause immediate tonic contraction when brought into contact with the digitalized heart. Even substances such as alcohol or potassium will contract the cardiac muscle in this condition, although normally producing diastole. Thus, it may be seen that the effect is not a specific one and is elicited only when the heart has been previously sensitized by digitalis.

It can also be demonstrated that digitalis and calcium do not exert their heart actions at identical points. If a Ringer's solution is used in which the calcium content is forty times increased, an immediate tonic standstill of the cardiac muscle is obtained. When digitoxin is added to such a strong lime solution, two processes become apparent. First, owing to the ion action of the calcium, there is an instantaneous cardiac contraction and the heart stops beating. The calcium-digitoxin is allowed to remain in the heart until a sufficient amount of digitoxin has become fixed in the cardiac cells. If, now, the calcium as well as any unfixed digitoxin is removed by repeated rinsing with calcium-free Ringer's solution, an immediate relaxation is observed, and the heart begins to beat again. Meanwhile, the fixed digitoxin continues its uninfluenced action on the heart, which finally will come to a standstill—irreversible, this time—within the normal period corresponding to the dose administered. The action of this fixed digitoxin cannot be reversed, whether the washing is done with a calcium-free or calcium-containing solution. Thus, it is possible to demonstrate that the two substances have different points of attack and that their actions cannot be identical.

This should not prevent us, however, from combining the two substances for therapeutic purposes, because calcium certainly stimulates cardiac contraction when administered in proper concentration, a summation of effect being accomplished when calcium is allowed to act on a heart sensitized by digitoxin. Nevertheless, this is not so easily accomplished in clinical practice, as the calcium level of the blood is very rigidly maintained. If one wishes to increase it perceptibly, e. g., to double the normal amount, about 10 cc. of a 10 per cent solution of calcium chloride may be injected intravenously. If the heart is already sensitized by digitalis, an increase of the calcium content of the blood will act as a sufficient stimulus to cardiac contraction.

The difficulty in the therapeutic employment of this combination is that within thirty minutes after an intravenous calcium injection the calcium content of the blood becomes normal again, so that the summation effect of the two substances disappears. With this method of administration a decided enhancement of digitalis action, but of short duration, is obtained. It would seem advisable, therefore, to recommend the oral administration of lime, e. g., a teaspoonful of calcium carbonate every two hours.

NATURE OF ACTION OF OTHER DIGITALIS SUBSTANCES

One question now remains to be answered: Do all the digitalis substances behave in the same manner as digitoxin? The answer is negative: The three active glucosides present in the leaves comport themselves differently, not because these glucosides are not firmly fixed in the cardiac muscle—probably all digitalis glucosides combine irreversibly with the heart cells—but because of the differences between their cleavage products. The more difficult the hydrolytic splitting of a glucoside, the longer do its molecules remain irreversibly fixed to the cardiac muscle and the more lasting is its action. The easier the molecule is broken down and the more rapidly the liberated "aglykons" are eliminated from the muscle, the shorter will be the glucosidal effect. Digitoxin is broken down with great difficulty;

it clings long, therefore, to the heart cell. Its genin has the strongest action of all the split products of digitalis glucosides. The gitalins are easily split, their genins have a weak action and can be washed out immediately.

Should one, for instance, administer intravenously to a patient the three glucosides in doses of equal biologic strength, the same momentary action would at first be obtained. But the effect of digitoxin will last longer than that of the other glucosides; the danger of a cumulative effect, of course, will also be greater with repeated injections of digitoxin. On the other hand, when equal doses of the three glucosides are given orally, the action will be different, the hydrochloric acid of the stomach beginning to break them down partially. Here, too, digitoxin appears as fairly resistant and its genin possesses a tenfold stronger effect than the genins of the other glucosides. The therapeutic action of digitoxin, therefore, will be most prominent. The other glucosides have to be given in comparative overdosage in order to yield the same results as digitoxin. (The easy cleavage and the weak effect the "aglykon" produces is the reason why strophanthus preparations are so little effective when given by mouth.)

Everything I have discussed so far refers only to the cardiac muscle. Much could be added, particularly regarding the influence on the rhythm and the stimulus-conducting system, but this is such a difficult problem and still so little investigated that it is better not to go into it; clinicians are, after all, much more interested in the muscle action.

EXTRACARDIAC EFFECTS OF DIGITALIS

A few more words on the so-called extracardiac effects of the digitalis substances. We know that, besides the cardiac manifestations which we value so highly, side-actions have unfortunately been often observed in digitalis therapy. This is due to the specific action of digitalis on the autonomic nervous system. In view of the many functions which the autonomic nervous system exerts in the body, it is understandable that a chain of the most varied disorders might develop. One thus sees, particularly in man, gastric disturbances which do not owe their origin to the local irritation produced by the oral administration of the digitalis preparation. I refer to the gastric complications which originate some time after digitalis therapy has been instituted and which may arise when the drug is administered by injection. These disturbances consist in gastric hypersecretion and hypermotility. In these cases an increased hydrochloric acid secretion can be demonstrated, and roentgenographically it becomes apparent that the stomach changes from the normal hooked form into that of tonic contraction, as shown by Vail.

A stimulating effect on pancreas function is also observed. It happens that violent diarrheas which are due to a hypofunction of the pancreas can be cured by digitalis.

Kidney function is influenced in the same manner by digitalis, not merely through the circulation, which would be natural, but primarily by a specific influence on the renal parenchyma. The excretion of sodium chloride is especially promoted, even when water elimination does not increase. Digitalis is therefore a genuine diuretic.

Furthermore, it is observed that the action of digitalis causes an outflow of alkaline bodies from the tissues into the blood, the alkalinity of which is often increased in man, alkalis being excreted through the urine which would not have been otherwise eliminated.

CONCLUSION

These are a few examples of the complexity of the problem. Unfortunately, we still know too little about these matters. We shall have to study them further during the coming years. It is to be hoped that the knowledge of all the factors concerned will enable us to obtain a conclusive and complete picture of the action of digitalis.

IS IRRADIATED FARINA AS BOUGHT IN THE MARKET ENRICHED WITH VITAMIN D?*

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AND
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MINNEAPOLIS

Within the last year there has appeared on the market a farina "irradiated with ultraviolet rays to impart the bone building vitamin of sunshine." It is claimed that the addition of vitamin D has been accomplished by irradiating the farina with ultraviolet rays under the Steenbock process, Wisconsin Alumni Research Foundation. In connection with some research being done in this department, a few feeding experiments were carried on to determine something concerning the antirachitic potency of such irradiated farina.

EXPERIMENTAL METHODS

Our breeding stock is kept on Bills's [1] modification of Steenbock's ration for stock rats.

The experimental animals used in this study were obtained from a breeding stock which had been on this diet for at least four generations. Rats 28 days old and weighing approximately 45 Gm., never less than 35 Gm. or more than 50 Gm., were put on Steenbock's diet *2966*.[2]

The diet was made from finely ground yellow seed corn, purity 99 per cent, germination 95 per cent. The wheat gluten was free from starch. The gelatin was "Difco," with a low phosphorus content. The same supply of calcium carbonate and sodium chloride was used throughout this study; both were high grade chemicals of tested purity.

The animals always had access to distilled water. They were weighed three times a week. The food was always weighed daily except Sundays. If the rats did not eat 2 Gm. of food in any one day, or lost weight, they were discarded.

When an experiment was terminated, rats were anesthetized with ether and blood was obtained by cutting the external jugular veins. The same conditions were adhered to as nearly as possible for killing all the rats, as it is well known that the depth and time of anesthesia will cause an increase in inorganic blood phosphates.[3] The blood obtained from the individual animals of the different groups was pooled and centrifugated, and the serum was used for analyses.

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* From the Department of Pediatrics, University of Minnesota Medical School.

1. Bills, C. E.; Honeywell, Edna M., and McNair, W. A.: J. Biol. Chem. **76**: 251 (Jan.) 1928.
2. Steenbock, Harry; and Black, A.: J. Biol. Chem. **64**: 274 (June) 1925.
3. Koch, Elizabeth M., and Cahan, M. R.: Inorganic Blood Phosphate, Am. J. Dis. Child. **34**: 187 (Aug.) 1927. Martland, M., and Robinson, R.: Biochem. J. **18**: 765, 1924.

Bone ash analyses were made of the femurs. They were dissected free, scraped from adhering tissue, composited into the different experimental groups, and air-dried for several days. The bones were then extracted in a Soxhlet fat extractor for twelve hours with ether, followed by a twelve hour treatment with alcohol. They were dried in an oven at 110 C. until free from moisture and ashed in an electric muffle furnace at 650 C. until the ash was white and the weight constant. The bone ash analyses were used to calculate the A/R ratio, which is the value of the ratio of bone ash to the organic residue of the bones.

The experimental colony is kept in an east room. The light conditions are maintained as constant as possible.

Results from the Feeding of Nonirradiated and Irradiated Farina

Group	Rat No.	Age, Days	Weight, Gm.	Food Consumption per Day Gm.	Inorganic Blood Phosphorus, Mg. per 100 Cc.	A/R Ratio	Roentgenograms
			Ration 2966				
1	260	28-(49)-59	40-64-74	5.8	2.30	0.33	Marked rickets
	261	28-(49)-59	42-56-65	5.6			
	262	28-(46)-61	48-72-75	5.8	2.20	0.34	Marked rickets
	263	28-(46)-61	44-68-70	5.2			
			Ration 2966 + 2% Cod Liver Oil				
2	...	28-49-59	36-62-66	6.0	4.79	1.50	No rickets
	...	28-49-61	40-62-68	5.0	5.20	1.48	
	...	28-49-65	38-65-70	7.0	7.50	1.30	No rickets
	...	28-49-65	42-64-72	6.5			
			Ration 2966 Containing 10 per Cent Nonirradiated Farina				
3	272	28-46-61	50-76-84	6.0	2.56	0.31	Marked rickets
	273	28-49-61	50-76-80	5.8			
	274	28-49-61	40-62-65	5.6			
	284	28-46-61	48-78-86	6.1	2.54	0.34	Marked rickets
	288	28-46-61	50-78-86	5.4			
			Ration 2966 Containing 10 per Cent Irradiated Farina				
4	192	28-49-59	48-70-76	5.7	2.56	0.38	Marked rickets
	193	28-49-59	40-66-68	5.8			
	242	28-46-61	46-62-64	5.8	2.36	0.51	Marked rickets
	243	28-46-61	40-58-66	6.5			
	245	28-46-61	44-58-60	6.5	2.40	0.30	Marked rickets
	246	28-46-61	36-52-58	5.9			
	247	28-46-61	40-56-60	5.8			

The room temperature is constant at 70 degrees ± 1 degree. The rats are kept in square cages 12 by 12 by 12 inches, made of galvanized wire of three meshes per inch, with flooring of the same wire. A cage was provided for each animal.

In this series four groups of rats were placed on diet 2966 for eighteen and twenty-one days, respectively. At the end of that period two animals were killed from each group; an inorganic blood phosphorus analysis was made according to the method of Fiske and Subbarow [4] and a roentgenogram was taken to determine the degree of rickets and hence whether the group was ready to go on a test ration.

Irradiated farina and untreated farina were purchased in the open market and incorporated as 10 per cent of the test ration. The treated farina as purchased was in a box on which was printed a description of the addition of vitamin D to the farina by ultraviolet rays. Ten per cent was the amount selected for addition to the rachitic diet, because it was considered an amount comparable to that which the average child would receive daily in his ration.

The rachitic rats were kept on the test diet for ten and fifteen days. At the end of that time they were killed. The blood was analyzed for inorganic phosphorus, roentgenograms were taken, and the ash content of the femurs was determined.

4. Fiske, C. H., and Subbarow, Y.: J. Biol. Chem. **66**: 375 (Dec.) 1925.

RESULTS

The results are given in the accompanying table.

Blood Serum Analyses.—The inorganic phosphorus of the blood of the rats receiving diet 2966 and the same diet supplemented with nonirradiated farina indicated rickets. The rats that received irradiated farina as a supplement showed no increase in blood phosphorus and therefore no healing of the rachitic condition.

The A/R Ratio.—This ratio did not show any increase on analysis of the bones of the animals fed 10 per cent irradiated farina incorporated in the rachitic diet.

Roentgenograms.—These were made of the tibia-femur joints of all the rats. All the pictures showed rickets with no indication of increased calcification, and hence no healing.

Growth.—The rats under observation made a good gain in weight.

COMMENT

Irradiated farina was fed to a series of rachitic rats for a period of ten and fifteen days in order to determine whether it is curative in rickets. Our results obtained from blood and bone analyses and roentgenograms do not indicate that any healing is obtained when treated farina, as purchased in the market, is incorporated as 10 per cent of the ration in a rachitic diet (2966).

In view of the negative results obtained in this laboratory with irradiated farina, it does not seem possible that the claims made for it are worthy. The following statements are taken from a pamphlet sent to the medical profession:

"Irradiated . . . farina does for the growing child what no other farina can do. . . . With the exception of natural sunlight it is probably the most palatable, accessible, and usable weapon against rickets ever given to mothers."

If the results in the table for irradiated farina are compared with those for nonirradiated farina, it will be seen that they are decidedly negative for both groups.

SUMMARY

Irradiated farina, as purchased in the open market and incorporated as 10 per cent of a rachitic diet, does not cure rickets in rats.

Meat and Anemia.—Meat is the best blood builder. I have repeatedly been impressed by the anemia of patients who practice dietary restriction. Red cell counts of three and a half million and less in my experience are common, and inquiry often reveals the fact that among other faults the patients who exhibit such anemia are accustomed to take dangerously little protein. In view of the revelations of Whipple and his co-workers on the blood-building qualities of meat, we cannot help but suspect that the anemia of these patients is due in large part to their abnormally low protein intake, which suspicion is strengthened when we witness the marked benefits which accompany the addition to the diet of liberal quantities of meat.—McLester, P. S.: The Protein Problem, *Ohio State M. J.*, September, 1929.

Clinical Notes, Suggestions and New Instruments

MECKEL'S DIVERTICULUM ASSOCIATED WITH SEVERE HEMORRHAGE

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T. T., a boy, aged 8 years, was admitted to the Baptist Hospital, Dec. 25, 1928, with the complaints of pain and cramps in the abdomen, bleeding from the bowels, weakness, nausea and vomiting, of four days' duration. The mother first noticed marked pallor, December 21, so that the child did not go to school. The following day the boy appeared weak, and laxatives did not give any relief. The pallor increased and Sunday, two days after onset, nausea and vomiting appeared. An enema was given Sunday evening; the return showed a large quantity of blood. There was a complete loss of appetite. The child had always been sickly and had frequent attacks of abdominal pain. Previous bleeding was not noted. There was no history of bleeders in the family, and no purpura.

The child was first seen, December 25, four days after onset. Examination at that time showed a severe secondary anemia with profound pallor of the mucous membranes. The heart rate was rapid, 130. There was no rigidity in the abdomen. Slight abdominal distention was present, and slight tenderness to the right of the umbilicus. There was retraction of the navel. The spleen was not felt. There was normal peristalsis. Rectal examination did not reveal any masses. The stools were dark and bloody. Gastric lavage did not reveal any blood in the gastric contents. The patient appeared weak and was unable to raise himself in bed. The urine was normal. The blood count showed 1,500,000 red blood cells; hemoglobin, 30 per cent; 6,400 white blood cells, and normal platelets. There was normal clotting and coagulation time. The differential count and clot retraction were normal.

December 25, 300 cc. of blood was given with the syringe method. Frequent loose bloody stools continued, but the color and general condition improved following transfusion.

December 26, transfusion was repeated. December 27, the stools were still bloody and frequent. Operation revealed an elongated Meckel's diverticulum. It was removed and the stump was inverted. Transfusion was repeated while the patient was on the operating table. The diverticulum had a broad base, and an unusually large artery was seen to be eroded. Postoperative convalescense was uneventful.

COMMENT

It was our privilege to see this patient and make the presumptive diagnosis, which was verified at operation. Recovery was prompt and so far has been permanent. Since no positive diagnostic points are present, the bleeding from an ulcerated Meckel's diverticulum must be borne in mind whenever severe hemorrhage from the bowel is encountered.

The presence of a diverticulum from the small intestine has been known to exist since early in the eighteenth century, and it was first definitely described by Meckel, who recognized it as the remains of the vitelline duct. During the early weeks of fetal development the midgut is connected to the vitelline vesicle by a fine tube, the vitelline duct. Normally, this tube atrophies and the bowel becomes completely separated from it, leaving no trace of its attachment. The only remains of the duct normally found are occasional cells in the umbilical cord. In from 1 to 3 per cent of patients, however, this normal obliteration does not occur.

The outer part in connection with the umbilicus may remain as a cordlike structure, while the proximal portion connected with the ileum remains patent and forms a diverticulum. This structure, the typical Meckel's diverticulum, is usually from 2 to 3 cm. in diameter and from 3 to 10 cm. in length. It projects from the lower part of the ileum within 1 meter of the ileocecal valve. The free end of the diverticulum may be connected to the umbilicus by the cordlike structure. This does not always occur, however, so in many cases the diverticulum hangs free in the abdominal cavity.

Little was published concerning bleeding or ulceration of this diverticulum in American literature until Abt and Strauss[1] presented their paper before the Section on Diseases of Children of the American Medical Association in 1926. At that time they presented three cases of their own and reviewed the literature covered by Stulz and Woringer with the addition of those reported by Griffith, Callender and Meyer. In the discussion of this paper, Moore, Neff, Schlutz and Stone added five more cases, although the one reported by Schlutz seemed a borderline case. Since that time Peterman and Seeger,[2] Shannon[3] and Tisdall[4] have reported three other definite cases, although Shannon reports another which is questionable, since it was associated with an intussusception of the diverticulum. The latter case might also be the one referred to by Schlutz, as he too saw the patient. The clinical history is singularly constant. In only three of these thirty cases was the patient a female. Intestinal hemorrhage and indefinite abdominal pain were the two outstanding symptoms. The earliest age at which intestinal hemorrhage was first observed was 4 months. Frequently there was only profuse hemorrhage, followed by apparent recovery for a period of months or years. Hemorrhage then recurred. Occasionally there were repeated small hemorrhages. The patients usually showed little evidence of shock. Since no assistance can be derived by roentgenologic or other examinations, the positive diagnosis can only be made at autopsy or by exploratory laparotomy.

Other cases will no doubt be reported at frequent intervals, since the profession is more on the alert for this type of bowel hemorrhage which must always be borne in mind when other definite sources of hemorrhage can be eliminated.

Medical Arts Building.

AGRANULOCYTOSIS ASSOCIATED WITH ANAL ULCER

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A considerable number of articles are available in regard to the subject of agranulocytosis; as these have been comprehensively reviewed in other recent papers,[5] no attempt will be made in this report to summarize the literature.

The term agranulocytosis was first suggested in 1922 by Werner Schultz[6] to designate a condition found by him in five cases showing febrile gangrenous angina involving the tonsils and neighboring tissues (one showing in addition a coincident gangrenous colpitis). These cases were all characterized by a marked leukopenia and almost complete disappearance of polymorphonuclear leukocytes from the blood smear. The published case reports and the description of the disease and its manifestations do not include, so far as I have been able to determine, any examples of this condition occurring in association with primary ulcerative or gangrenous lesions in other parts of the alimentary canal than the throat. Secondary ulcerations have been described in association with a primary angina, but the latter seems to have been the first site involved in all cases. The case reported here is presented chiefly because the only lesion to be found was an indolent ulcer of the anus.

REPORT OF CASE

J. C., a married woman, aged 45, first seen at the request of the attending surgeon, October 28, had complained of pain five weeks previously in the region of the anus, with considerable swelling of what were presumed to be hemorrhoids. There was slight bleeding from the rectum at this time. Sixteen days before, the pain had become acute, and for three days the patient was in great distress. At the end of this time she was taken to the hospital, where hemorrhoidectomy was performed and a rather deep anal fissure was noted. On the evening of the

1. Abt, I. A., and Strauss, A. A.: Meckel's Diverticulum as Cause of Intestinal Hemorrhage, J. A. M. A. **87**: 991 (Sept. 25) 1926.
2. Peterman, M. G., and Seeger, S. J.: Meckel's Diverticulum with Hemorrhage, Am. J. Dis. Child. **36**: 515 (Sept.) 1928.
3. Shannon, W. R.: Arch. Pediat. **45**: 693 (Dec.) 1928.
4. Tisdall, F. F.: Unusual Meckel's Diverticulum as Cause of Intestinal Hemorrhage, Am. J. Dis. Child. **36**: 1218 (Dec.) 1928.
5. Kastlin, G. J.: Agranulocytic Angina, Am. J. M. Sc. **173**: 799 (June) 1927. Hueper, W. C.: Agranulocytosis (Schultz) and the Agranulocytic Symptom Complex, Arch. Int. Med. **42**: 893 (Dec.) 1928.
6. Schultz, Werner: Ueber eigenartige Halserkrankungen, Deutsche med. Wchnschr. **48**: 1494 (Nov. 3) 1922.

operation her temperature rose to over 100 F. She left the hospital after six and a half days, against advice. Her husband stated that she had been increasingly weak since the operation and had grown paler. She no longer complained of pain, and there had been more or less fever since the operation. Frequently her temperature was apparently normal. There was considerable vomiting after eating. It was thought that she had lost 30 pounds (13.6 Kg.) during the preceding two weeks. The present chief complaint was weakness.

The past history showed that twenty years previously the patient had had "anemia," at which time she was tired for about a month. Four years before, she had lumbago. Three months before her present illness she had what was called the grip and had not felt up to par since. Otherwise there was nothing significant in the past history.

On physical examination the patient appeared normally developed and in a fair state of nutrition, and was lying quietly in bed. She was apathetic and seemed slightly dull mentally. She looked sick. Her skin was pale and her cheeks were sunken. The forehead was hot, while the extremities were cold. Her temperature by mouth was 101.4 F. She moaned and picked at the bed clothes but she had no pain. Her skin was normally soft and fairly moist. Her hair was dyed brown but the roots were gray. The pupils reacted normally. The palpebral conjunctivae were pale. There were no petechiae. The hearing was normal. The lips were dry and showed a few sores. The tongue was red and had a slight brownish coat with a few sordes and food particles. The mucous membranes and gums were normal. The throat was normal. The thyroid was slightly full. The chest moved well with respiration. The lungs were resonant. Breath sounds were vesicular except for a patch about 2 inches in diameter at the base of the right lung near the vertebral column, were there was bronchial breathing, and râles which were medium sized, moist and nonconsonating, from the right base up to the angle of the scapula. The apexes were clear. Respirations were 26 a minute. The heart was definitely enlarged to percussion. The sounds were regular but tumultuous. There was a protodiastolic gallop. A soft, blowing, low pitched murmur was audible at the apex. The apex rate was 120 a minute. The blood pressure was 106 systolic and 56 diastolic. The abdomen was normal except for slight muscular spasm and distention in the lower portion. There were no rose spots over the skin. No viscera could be felt. There was no evidence of meningitis. The extremities did not show petechiae. The anal fissure had not healed; there was a moderate foul discharge. The appearance of the patient was septic.

During the next few days after the patient had been removed to the hospital, two Widal tests were negative, and blood cultures showed no growth after seventy-two hours. The blood Wassermann test was negative. The urine was normal. A transfusion of citrated blood was given, October 30.

November 1, because of slight drooping of the upper lid and somewhat increased stuporousness, a lumbar puncture was done with negative results. A roentgenogram of the chest showed considerable density around both hila with some increase in the normal lung markings over the right side. The films were compatible with an acute inflammatory process involving the right side of the chest, with some increase going out from the left hilum. The local condition around the anus improved under antiseptic dressings. November 7, a portion of bone marrow was removed from the sternum for study by Dr. William C. Dameshek.

Rectal examination, November 11, showed induration in the perianal regions on the left side and a superficial ulcer which admitted a probe about 1 inch. On digital examination there was a crater-like ulcer the size of a quarter (25 mm.) on the left side of the anal canal. All about the edges of the ulcer the tissues were much thickened and indurated, extending 1½ half inches from the ulcer and more than this anteriorly. No infection in the superior pelvirectal spaces or localized infection of the perirectal or ischiorectal region could be made out.

The patient continued to go down hill and died, following transfusion, December 3.

The blood examinations were as follows:

October 28, red cells, 3,235,000; white cells, 4,000; smear, no achromia, slight variation in the size of the red cells, some moderately large. A differential count was not made. Lymphocytes seemed to predominate.

October 30, red cells, 3,220,000; white cells, 3,950; smear, polymorphonuclears, 21 per cent; lymphocytes, 70 per cent; mononuclears, 6 per cent; eosinophils, 2 per cent; basophils, 1 per cent.

November 3, hemoglobin (Tallqvist), 60 per cent; platelets, 100,000; reticulocytes, 0.4 per cent; smear, polymorphonuclears, 10 per cent; lymphocytes, 78 per cent; mononuclears, 12 per cent.

November 6, red cells, 2,690,000; white cells, 2,100; hemoglobin, 62 per cent (Sahli).

November 7, the bone marrow (sternum) was red and showed myelocytes and a few myeloblasts. The bone marrow cells were examined not only by vital dye (neutral red and janus green) but by oxidose stain and special Wright's stain for bone marrow smears. All these methods checked in showing myelocytes and a few (about three per hundred) myeloblasts. A blood smear on the same day showed that the white blood cell count was very low. Only twenty white cells could be found. Of these eighteen were lymphocytes, one a myelocyte, and one a questionable myeloblast. The red cells showed no achromia; the platelets were definitely diminished. Except for the red bone marrow, the picture was that of an aplastic anemia. The red bone marrow, which contained myelocytes and myeloblasts, definitely ruled out aplastic anemia. The only other possibility was that of a toxic or septic factor preventing the myelocytes from awakening and getting into the circulation. This would correspond with "agranulocytic angina."

November 8, the red count was 2,520,000; the white count, 3,550, and hemoglobin, 63 per cent (S). A smear showed three polymorphonuclears, two pale, with poorly lobulated nuclei, and the third well stained with a pyknotic nucleus. Lymphocytes were mostly of normal size and appearance, small, with little cytoplasm. Numerous large, paler lymphocytes with coarse granules were seen. Many cells were not identified definitely. A differential count (eighty cells) showed polymorphonuclears, 3 (4 per cent); small lymphocytes, 56 (70 per cent); mononuclears, 7 (9 per cent); myeloblasts 3 (4 per cent); granular lymphocytes, 5 (6 per cent), and large lymphocytes, 1 (1 per cent). One normoblast was seen in the whole smear.

November 13, the red count was 2,030,000; the white count, 3,350, and hemoglobin, 64 per cent (S).

November 15, the red count was 1,840,000; hemoglobin (S), 44 per cent; the platelet count, 18,000, and the reticulocyte count, 0.5 per cent.

November 16, the red and white count were as previously noted, and the hemoglobin was 45 per cent (S).

November 20, the red count was 1,660,000; the white count, 2,550, and hemoglobin, 39 per cent (S).

November 23, the red count was 1,700,000; the white count, 2,350, and hemoglobin, 30 per cent (S).

November 26, the red count was 1,300,000; the white count, 2,600, and hemoglobin, 27 per cent (S).

November 30, the red count was 850,000; the white count, 1,700, and hemoglobin, 19 per cent (S).

December 3, the red count was 1,085,000, and hemoglobin, 17 per cent (S).

Autopsy showed some pleural and pericardial effusion, with cardiac hypertrophy and dilatation, chronic fibrous and fatty myocarditis and a mural thrombus on the wall of the right ventricle. The spleen was large and friable, weighing 340 Gm. Microscopically it showed nothing important. The lymph nodes were negative. Bone marrow from the femur showed normal cells in number and character. Sections through the bone marrow presented microscopically evidence of a moderate activity of both the red and the white cell elements. The myeloid hyperplasia appeared rather the more marked. There were many megakaryocytes. There was nothing distinctly diagnostic about the bone marrow other than evidence of acute hematopoiesis, which suggested a secondary rather than a primary type of anemia. The anal ulcer had healed completely.

COMMENT

The case of agranulocytosis reported here is remarkable chiefly because of the fact that the ulcerative lesion was in the anus. The clinical picture was not one of fulminating septicemia. The patient probably had an associated bronchopneumonia, but this did not cause death.

475 Commonwealth Avenue.

Special Article

REPORT OF COMMITTEE ON OPTICS AND VISUAL PHYSIOLOGY

DIAGNOSIS OF POOR VISION AND THE TREATMENT OF EYESTRAIN *

Our civilization is based on accurate vision—what can be learned through it, what can be done with its guidance, what can be enjoyed by its exercise. The use of sight is pushed to the limit of its power in the preparation for the work of life, from the time of beginning school to the completion of professional, business or mechanical training. The general lengthening of human life carries more and more over into the age of presbyopia, when all eyes require optical assistance, and the advancing refinements of most occupations tend to compel optical assistance at all periods of life.

Within the last century it has become evident that a large majority of eyes present sufficient errors of refraction to make the correction of their defects essential to their continued use in the common, educational, economic or recreational activities of their possessors. Presbyopia, the increasing disability that comes to all with age, is better understood. Myopia is found to be a common effect of school life, rendering the myopic person unfit for some essential duties and occupations. Hyperopia is present in the majority of eyes to such an extent as to cause poor sight or strain. Astigmatism is known to be present in a large proportion of eyes to a degree causing interference with their usefulness in important lines of employment and occupation. All of these conditions cause disability or serious strain of the nervous system. Errors of ocular movement or positional balance may cause equally bad effects. Such conditions need to be corrected by glasses.

The publication by Donders, sixty-five years ago, of his "Accommodation and Refraction of the Eye" called attention to the wide range of symptoms and pathologic conditions arising from attempts to see accurately with eyes optically defective and to the necessity of correcting such defects by glasses. Before that time glasses were worn to retain near vision that would be lost in presbyopia, to give distant vision in myopia, and by the few who had traced their own defective vision to astigmatism. The work of Donders and those who learned to apply lessons he taught demonstrated that asthenopia, weakness of eyes or of sight, was due to uncorrected errors of refraction; soon chronic ocular congestion or inflammation affecting the conjunctiva, lids or choroid was found to arise from the same source. Aching of the eyes or pain referred to other parts, vertigo, nausea, nervous dyspepsia, malnutrition, hyperesthesia, mental depression, melancholia and illusions were sometimes due to the nerve strain of trying to avoid the blurring, or double vision, produced by ocular defects and might be prevented or removed by the wearing of the proper lenses or prisms.

The discovery of the general effects of eyestrain in causing disease, with the enormous increase in reading, sewing and other fine work, and indoor occupations demanding accurate and sustained vision, increased the demand for glasses and the need to have them accurately chosen to correct the particular defects of each particular eye. It also made important the problems of discrimination as to the share ocular defects had in producing symptoms that might also arise from quite other causes. It made the determination and prescribing of glasses, with the recognition and removal of the causes of disease, an important part of the service of medical diagnosis and treatment. The general recognition of the medical bearings and importance of the fitting and wearing of glasses enormously increased the demand for them. Then questions of mass production and world markets began to overshadow in commercial importance the older problem of the optician, which was the meeting of the optical needs or preferences of the individual customer. Salesmanship now contends with service and, if one judges by aggressive advertising, salesmanship is ahead.

There is now need to emphasize the importance of service, by careful working out, by repeated tests and observations, of the exact refraction of each eye and with this the needs of the patient in the direction of ocular and general health. This cannot be done by men ignorant of medicine, by men who estimate success by monthly balances of profit on glasses sold, by manufacturers trying to get control of the market by copyrighted names for their goods, or by campaigns of advertising that will give the smallest portion of information and the most constant suggestion that the sure way to benefit is by ordering the goods under the name that has been copyrighted. If improved methods for manufacture and distribution of optical helps are to be utilized for the general good, the study of the individual and his needs must also be improved, extended and made more general. Commercialism must not dominate either the eye physician or the optician.

This will be done only by the medical profession led by those who have studied the eye in all its needs, dangers and vital relations. The importance of visual optics and the lenses and prisms that serve human optical needs have been perceived and developed since the medical profession began to understand the relations of vision to health. Any disposition of the medical profession to ignore its responsibility for this kind of health service to the people and leave it to unqualified mechanics or salesmen would suggest a willingness to shirk duty and neglect an opportunity to conserve health and promote scientific progress.

It is undoubtedly true that there are not enough properly trained, skilful ophthalmologists in this country to prescribe the right glasses and give the best advice as to the care of their eyes to all who need such glasses and advice. This is a reason why conscientious opticians and optometrists who know something about fitting glasses should still be permitted to give such advice as they can to the public and should be encouraged, by example and by friendly criticism, to improve their methods and gain the best understanding of the limitations of their knowledge. This is why general practitioners who know the bad effects of errors of refraction and muscle balance should do all they can to correct them.

But the emergency that has arisen from the discovery of the important influence of eyestrain on the general health, and the enormous increase in the number of people who need accurate vision and relief from strain to pursue their chosen occupations, does not justify the lowering of standards of diagnosis and of glass fitting. The chairman's address last year on the "Optometry Problem" might be understood and quoted to justify acquiescence in lower standards. But those who know Dr. Lancaster will not so understand it. He clearly stated: "The great obstacle to consultation between eye physicians and optometrists is commercialism. The practice of optometry is too much a matter of business. It must become a profession." His hope that "the optometrists will develop a professional spirit incompatible with commercialism" may seem too optimistic but is balanced by what he mentions on the preceding page regarding schools of optometry: "The standards have been made so high in New York State that the present entering classes in the two leading schools, the school at Columbia and that at Rochester, have dropped from around thirty or forty to less than ten."

When comparing optometry with dentistry, it should be remembered that the dentistry of earlier generations had been practiced by surgeons, that its development as a special profession was approached from the medical point of view, that the leaders of the dental profession had first studied medicine, and that many prominent dentists since then have taken the complete course in medicine and surgery and are members in full standing of the medical profession. The course in dentistry has always included certain fundamental branches of the course in medicine, and for some years it received formal recognition in a section of the American Medical Association.

There has been an energetic, persistent effort on the part of aggressive optometrists to secure and to keep up a confusion in the public mind with regard to the different classes of advertisers who claim to measure the refraction of the eye and correct it with glasses. Some seek the degree Doctor of Optometry, Doctor of Optics or a similar title from commercial schools chartered to confer such degrees. They like to be called "Doctor" by their customers, whom they speak of as

* Presented before the Section on Ophthalmology at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

"patients," and by every one else who will help them extend the impression that they know something about medicine applied to the eye. In a public garage recently signs were put up bearing the names of owners who kept their automobiles there. Next to the name of a member of this committee appeared "Dr. B.," not an M.D. but an aggressive optometrist whose display advertisements and picture appear in the daily papers. In many cities the optometrists have sought, and in some have gained recognition from school boards, to be considered competent to make health examinations of the eyes of school children. In certain publications it is customary to use the term "refractionist" to confuse oculist with optometrist and optician.

This policy of confusing the public has been helped by some ophthalmologists. In one city a member of the county medical society shares his reception room with an optician who uses the sign optometrist, and this M.D. refers to the optometrist his patients needing glasses. An ophthalmologist prominent in his county and state medical societies gives his patients a card stating the prices for which he supplies glasses, and pointing out the superior quality of glasses he furnishes and the high standing of the manufacturer. In some cities, prominent ophthalmologists have the bulk of their refraction work done by nonmedical assistants, some of whom have later set up in business as optometrists. Many ophthalmologists speak of the measurement of the eyes for glasses as a subordinate or less important part of their work. They leave it chiefly to junior assistants, as is generally done in public clinics. The supplying of glasses to patients without making clear to them the distinction between charge for glasses and that for professional service, and the practice of sending the patient to a wholesale optician for the fitting of his frames, also contribute to the confusion.

Sixty-five years after the publication of Donders' "Accommodation and Refraction of the Eye," and of Helmholtz's "Physiologic Optics," the important truths they contributed to medical science are still imperfectly known and appreciated by members of the Section on Ophthalmology and by the general medical profession. To promote a wider understanding of visual physiology and optics, and their practical application to the needs of eyes subjected to the requirements of vision in our civilization, seems to be the first important thing to be undertaken by our section. The diagnosis of eye symptoms and treatment of eyestrain should, so far as possible, be done by men and women educated in medicine.

EDWARD JACKSON, Chairman.
WILLIAM H. WILDER. CONRAD BERENS.
EDWARD C. ELLETT. JAMES M. PATTON.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, SECRETARY.

DIGITOS (See New and Nonofficial Remedies, 1929, p. 138).

The following dosage form has been accepted:

Digitos Ampules, 5 cc.

LUMINAL (See New and Nonofficial Remedies, 1929, p. 81).

The following dosage form has been accepted:

Luminal Capsules, 1½ grains.

METAPHEN (See New and Nonofficial Remedies, 1929, p. 272).

The following dosage form has been accepted:

Metaphen 2,500: 1 part metaphen dissolved in 2,500 parts of water containing 0.33 per cent each of sodium bicarbonate and sodium carbonate.

DIPHTHERIA TOXOID (See New and Nonofficial Remedies, 1929, p. 368).

E. R. Squibb & Sons, New York.

Diphtheria Toxoid-Squibb (see New and Nonofficial Remedies, 1929, p. 369): Also marketed in packages of one 30 cc. vial of diphtheria toxoid.

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

W. A. PUCKNER, Secretary.

QUICAMPHOL (TRANSPULMIN) NOT ACCEPTABLE FOR N. N. R.

In 1927 the Council considered Transpulmin, offered by the Chemisch-Pharmazeutische A.-G., Bad Homburg, Germany, "for the painless parenteral quinine-therapy in inflammatory affections of the lower air passages." Unwarranted therapeutic claims were contained in the advertising for Transpulmin: Thus a leaflet, "Graphic Description of bronchial and pulmonal affections successfully cured with Transpulmin," gave charts for "Typhoid fever and bronchitis," "Emphysematic bronchitis" and "Pulmonal abscess." On the reverse of the same leaflet there were a number of charts entitled "Graphic description of pneumonia successfully cured with Transpulmin." A trade package circular contained the statement: "the active principles of Transpulmin are all . . . excreted by way of the lungs," a statement contrary to the generally accepted and established facts regarding the excretion of quinine and camphor stated to be contained in the product. It was also asserted with reference to the "ether-oils" which were stated to be a component of Transpulmin that "these aromatic bodies exert a particularly powerful antiphlogistic and antisecretory effect upon the mucous membrane of the lower air-passages" and, further, "The camphor, in addition, has the particular property of promoting profuse hyperaemia in the lungs, and thus intensifying the effect of quinine and the ether-oils."

On the basis of the available evidence, the Council held Transpulmin to be an unscientific preparation of semisecret composition, marketed under a nondescriptive, therapeutically suggestive name with unwarranted therapeutic claims.

When the Council's statement of the consideration of Transpulmin was transmitted to Chemisch-Pharmazeutische A.-G., the firm took up in detail the Council's report. To remove the objection to the therapeutically suggestive name "Transpulmin," it proposed to market the preparation in the United States under the name Quicamphol. Further, it proposed the inclusion on the label of the following definite statement of composition: "1 c.c. equals 0.03 Gm. Basic Quinine, 0.025 Gm. Camphor, 0.18 Gm. Eucalyptol and 0.08 Gm. Menthol." The firm argued that the mixture was not unscientific and that its therapeutic claims were warranted, and sent a long list of references to publications concerning Transpulmin. The evidence for the value of Transpulmin in lobar pneumonia, influenza, etc., was unconvincing. Evidence for the value of quinine administered intramuscularly in the treatment of chronic suppurative processes of the lungs was cited, especially the work of C. E. Cahn-Bronner. The conclusions of Cahn-Bronner are, however, not supported by satisfactory evidence. His technic is open to grave objections, and the methods for the detection of quinine are interfered with by impurities. Attempts to confirm his conclusions have not met with success. It has been found that quinine leaves the blood very rapidly even after intravenous injection. It is fixed in the lungs in high concentration at once, but the concentration falls rapidly and after a few seconds the greater part has passed into the other tissues. Only traces of quinine can be found in the blood of patients after intravenous, oral or subcutaneous injection, and although quinine can be detected in 1,000,000 parts of blood, it cannot be estimated accurately in such dilution in blood or tissues.

According to "Notes on Therapy Submitted by Spicer and Company, Glendale, California, Vol. 1, No. 1, January, 1929," issued as a "Supplement to The Hormone," the house organ of The Harrower Laboratory, Inc., Quicamphol is sold in the United States by Spicer and Company, which firm was "formed to act as distributors in the United States for the Chemisch-Pharmazeutische A.-G., Bad Homburg." The firm offers Quicamphol "For intramuscular injection in bronchitis, pneumonia, and pulmonary infections generally." The Council does not consider the submitted additional evidence for "Transpulmin" (Quicamphol) to warrant a change in the decision to refuse acceptance for N. N. R. because the claims for the value of the preparation in the treatment of lobar pneumonia, influenza, etc., are unsupported by satisfactory clinical evidence.

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SATURDAY, NOVEMBER 9, 1929

FUNCTIONS OF THE INTERSTITIAL CELLS OF THE TESTIS

When it was recognized that the hypofunction or hyperfunction of glandular tissues of relatively small size but without ducts for delivery of their products could have effects on the body out of all proportion to the size of the organs involved, a new field was opened in medicine. The discovery that the dried, nonliving matter of certain of these organs might manifest the same physiologic effects as the living tissues themselves, the isolation in pure chemical form or as highly potent extracts of the active principles of some of the organs, and the chemical synthesis of the active principles of several of the ductless glands, have given a solid scientific foundation to endocrinology. The field is still encumbered, however, with much speculation. There has been a tendency to ascribe an endocrine function to any aggregate of cells morphologically different from their surrounding tissues and not having a recognizable relationship to their surroundings.

The testis and ovary exercise, no doubt, pronounced influence on the development of the secondary sexual characters. Probably such effects are mediated through a hormone or chemical substance delivered into the blood stream and acting on the tissues of the whole body. However, the presence in both the testis and the ovary of cells, usually referred to as interstitial cells, which are morphologically different from the essential and specific germ cells and which have no apparent direct relationship to the latter has led to much speculation and controversy as to whether the germinal cells or the interstitial cells are the chief factor in such endocrine function as the gonads may have. Especially in the case of the testis, which lends itself so readily to experimental manipulation, has the supposed endocrine function of the interstitial cells led to much research.

On the basis of the hypothesis that the interstitial cells of the testis constitute a specific endocrine organ, which has been dignified (?) in the German literature with such names as "puberty gland" and "organ of manhood," surgical procedures have been developed whose results, if the claims made for them could be accepted without question, would be of the greatest importance to mankind. Steinach of Vienna and his school claim that ligation of the vas, which is known to bring about degenerative and atrophic changes in the tubular spermatogenic tissue, leads to hypertrophy and hyperplasia of the interstitial cells, which, acting as an endocrine puberty gland, restore waning sexual function and cause a rejuvenation of bodily and mental vigor. Voronoff and his followers in France claim that they bring about the same results by the transplantation of normal testicular tissue of another human being, if obtainable, or of the higher anthropoids. The supposed action in the Voronoff procedure is the same as in that of Steinach. Transplantation leads to degeneration and disappearance of the tubular germinal cells and supposedly to hyperplasia of the interstitial cells. In any field in which the psychic element is so large a factor as it is in sexual inhibition or activity and in the correlated physical and mental manifestations, a true evaluation of results based on human experimentation is difficult.

Experimentation on lower animals, in which the psychic element is of less importance, should supposedly establish without question at least the morphologic changes that occur in the testis after such procedures as have been advocated by the rejuvenation adherents. It would seem that it should be easy to determine the correctness of the fundamental assertion on which such procedures are based; namely, that hyperplasia of the interstitial cells actually occurs. With this essential point established, it would still remain to be proved that the hyperplastic interstitial cell tissue, formed as the result of the procedures employed, has an internal secretory function. On this basic question of hyperplasia of the interstitial cells, the reported results of animal experimentation are almost as divergent as are those obtained in human beings, although the increasing volume of careful experimental work is beginning to permit more definite conclusions than earlier work warranted. Ligation of the vas in lower animals or transplantation of a portion of testicular tissue, even when the latter is derived from the same animal into which the transplantation is made, is followed by degeneration of the tubular epithelium, shrinkage of the tubules, and decrease in the size of the testis or of the transplanted portion. The interstitial cells, in the later stage of tubular degeneration and tissue shrinkage, are more evident than normal. This greater prominence of the interstitial cell tissue has led to divergent interpretations. Recent work warrants the opinion that this increase in the number of interstitial cells is only apparent, that it is only a relative increase due to the disappearance of other tissue elements, and that it is not an actual or absolute increase. So far as the procedures usually employed in the human being are concerned, namely, ligation of the vas or transplantation of tes-

ticular tissue, it is necessary to conclude that an increase in the number of interstitial cells does not occur.

The supposed or apparent hyperplasia of the interstitial cells following ligation of the vas is due to degeneration of the seminal epithelium of the tubules. Other experimental procedures will bring about the same changes in the tubules. It is pertinent, therefore, to inquire whether they lead to actual hyperplasia of the interstitial cells and, if so, whether any conclusions can be drawn as to the function of these cells. Kraus [1] of Prague, using the cat as the animal for experimental study, employed not only ligation of the vas or of the epididymis itself but also roentgen irradiation of the testis in its normal position, reposition of the testes into the peritoneal cavity, or their transplantation into the abdominal wall with intact pedicle; in some of the reposition and transplantation experiments, one testis was removed or the amount of testicular substance was reduced by successive resections, or the testis was irradiated. Both sexually immature and sexually mature animals were employed. Ligation of the vas or epididymis did not lead to any actual increase in the number of interstitial cells in either the younger or the older animal. Whatever the methods of experimentation used, the interstitial cells themselves disappeared if the procedure led to complete destruction of the tubular epithelium; persistence of the interstitial cells, which would be a prerequisite to their hyperplasia, required the persistence of viable undifferentiated or dedifferentiated germinal epithelium. In young animals, no hyperplasia of interstitial cells could be brought about by any of the methods tried; when such animals reached sexual maturity, the interstitial cells multiplied if the multiplication of tubular epithelium normal for this stage of the animal's life occurred. In the experiments other than simple ligation on older animals, actual hypertrophy and hyperplasia of the interstitial cells resulted. The increase occurred usually three or four months after the operation, when the degenerative changes in the tubules had passed their maximum and the persistent undifferentiated germinal epithelium had begun to proliferate. The degree of hyperplasia was greatest when the amount of testicular tissue was reduced either by unilateral castration or by successive resections. That an increase in the amount of interstitial cell tissue can be brought about by the proper experimental procedure, but not by simple ligation of the vas, appears established by the work of Kraus and others. This fact being established, what light does it shed on the function of the interstitial cells? Kraus's own conclusions are that the cells do not have the resorptive function ascribed to them by some, because they do not begin to multiply until toward the end of the stage of degeneration of tubular epithelium. He also denies a general endocrine activity, in the sense that the interstitial cells act on the body as a whole and help to determine the secondary sexual characteristics; this, he urges, is a function of the specific germinal cells. The chief function of the interstitial cells seems to be a trophic one, the furnishing to the germinal epithelium of specific nutritive substances necessary for normal spermatogenesis. The transfer of such substances is an indirect one by way of the local circulation, and not a direct one by means of canaliculi extending from the interstitial cells to the germinal epithelium, as has been claimed by some. Endocrine function is not entirely denied by Kraus, but this function is exercised, not on the body as a whole, but only on the testis itself, being a factor in normal spermatogenesis. This endocrine activity, he suggests, is probably mediated through the hypophysis or the midbrain.

1. Kraus, E. J.: Experimentelle Untersuchungen über die Zwischenzellen des Katzenhodens und über die Bedeutung der Zwischenzellen, Beitr. z. path. Anat. u. z. allg. Path. **81**: 323 (Dec. 17) 1928.

ASUEROTHERAPY

Newspaper accounts and a number of questions coming to the headquarters of the American Medical Association indicate much interest recently in Spain and in the Latin American countries in a method of treatment of which the chief exponent is Fernando Asuero. Of late the Latin American countries have had at least their quota of peculiar healers: both allegedly scientific and religious healers who seem to rely primarily on the power of suggestion for their results. As the story is told by Clare Ousley in the New York *World*, the newest miracle man of Spain is undergoing much the same type of exploitation that has been associated with previous healers from Mesmer to Coué. The evolution of the faith healer is in itself one of the strangest records known to man and one that has perhaps never been adequately recorded.

Dr. Asuero maintains a temporary residence in Madrid. Outside the gates and in the streets, babies born with crippled arms and legs, old people accustomed to life in wheel-chairs, patients with all sorts of chronic diseases assemble and await the attention of the master. The system of treatment seems to include nothing more than cauterization of the sphenopalatine ganglion or of the endings of the trigeminal nerve in the nose. In other words, this is essentially an attempt to extend as a universal system of healing the method introduced by Sluder [1] in 1908 as a form of treatment for headaches and for certain neuroses. Ousley's report credits the French laryngologist Bonnier [2] as being the first to show that the branches of the trigeminal nerve and of the sympathetic could be cauterized in the nose, as indeed he did in an article, published in 1907, describing the control of diarrhea and other symptoms by this method. Apparently Asuero in applying his cauterization gazes fixedly into the eyes of the patient,

1. Sluder, Greenfield: Concerning Some Headaches and Eye Disorders of Nasal Origin, St. Louis, C. V. Mosby Company, 1918.
2. Bonnier, Pierre: Entérite reflexe d'origine nasale, Rev. neurol. **15**: 755, 1907.

and uses all the force of his personality. Associated with the direct application of the treatment, therefore, is suggestion. Thus certain forms of hysterical paralysis are relieved, as such cases have always been relieved, regardless of the form of treatment, when the suggestion is sufficiently powerful. Thus patients with chronic arthritis, weak hearts and similar disturbances are led to make extra efforts which momentarily seem like cure but which may promptly be fatal. Thus sufferers from headaches, from cancer, or from other painful conditions shout that their pains are relieved.

The medical periodical literature concerning the Sluder technic and its various modifications is by now quite extensive. It indicates some usefulness and quite definite limitations for this method of treatment. No doubt, the exploitation of the method by the Spanish physician who would use it for almost every ailment to which humanity has been heir will do much to hasten the establishment of the limitations. This method will, like all the other technics—the counting of knots, the mesmeric passes, the murmuring of incantations, the use of relics, the laying on of hands, the reading of a text prepared by an hysterical woman from the maunderings of America's first prophet of mind healing, Phineas Parkhurst Quimby—this method too will have its day in the sun and depart at last to the records of forgotten all-or-nothing systems for the healing of disease.

THE OUTLOOK FOR MALARIA CONTROL

Three species of the genus *Plasmodium* are parasites of human malaria; these are *P. vivax*, the organism of tertian malaria; *P. malariae*, the organism of quartan malaria, and *P. falciparum*, the organism of estivo-autumnal malaria. Insects are responsible for the transfer of these noxious parasites. More than five hundred species of mosquitoes have been described, the majority of which belong in the tropics, although the North is richer in individuals. Fortunately only female mosquitoes belonging to the genus *Anopheles* are parasitized by malarial parasites and are able to transfer the latter to man; but there are several species of *Anopheles* involved as vectors in the transmission of the human disease. The number of anopheline species demonstrated to be capable of promoting the development and distribution of the malarial plasmodia is growing, so that one writer[1] has remarked that the safest plan is to consider any mosquito of the genus *Anopheles* a carrier until proved otherwise.

The already recognized different types of malarial parasites and *Anopheles* carriers present a considerable number of variables that have greatly complicated the problems of malaria control. It has become imperative to learn the life histories, habitats and distribution of a considerable number of living forms in order to meet all the exigencies of desired relief. These facts need to be realized by persons who have become skeptical regarding the outlook for malaria control. All too often both physicians and laymen look on the problem as relatively simple and thus fail to comprehend why greater progress has not been made since it was first clearly demonstrated that both the incidence of malaria and the existence of mosquitoes can be controlled. The intricacy presented is illustrated in a recent survey[2] by officers of the United States Public Health Service regarding the seasonal and regional incidence of malaria parasites. It indicates that in the southeastern United States there is a marked predominance among malaria cases in the white race of *P. vivax* in the spring months and of *P. falciparum* in the autumn. In the colored race there is less indication of a seasonal incidence of types of parasites, but the incidence of *P. falciparum* is higher in all months than in the white race. A large proportion of the cases present mixed infections of *P. falciparum* and *P. vivax* at some time during their history. The greater resistance of *P. vivax* to treatment or to other antimalarial influence is probably the most important factor in determining the seasonal variation of *P. vivax* and *P. falciparum* in the white race and of the high incidence of *P. falciparum* in the colored. *P. falciparum* apparently has not become well established in the Rio Grande Valley of Texas and New Mexico. *P. vivax* is the most predominant type there at all seasons of the year.

Although malaria has always been heaviest in rural districts, most malaria control work has been urban. The problem of cost enters into this feature of the program. Again, as a Public Health Service writer[3] has recently pointed out, although quinine will control the case rate in active malarial sickness, it has never been popular among our people; and, wherever attempted, it has required too large a personnel group and too much time, and the result has never been sufficiently striking to cause an extension of the measure.

Thus new procedures must continually be devised to meet the often baffling factors represented by the parasites, the mosquitoes and man. Among the latest suggestions is the prevention of the production of *Anopheles quadrimaculatus* by means of paris green as an anopheline larvicide. The poison can be dusted by suitable machinery on lakes impounded for hydroelectric purposes. Obviously the arsenical preparation involves dangers to animal life that in turn need careful consideration. However, the dominant counsel today should be one of encouragement. It was well presented by Williams[3] at a conference of state and territorial health officers with the United States Public Health service in Washington last June. Ross proved

1. Chandler, A. C.: Animal Parasites and Human Disease, New York, John Wiley & Sons, 1922.

2. Barber, M. A., and Komp, W. H. W.: The Seasonal and Regional Incidence of Types of Malaria Parasites, Pub. Health Rep. **44**: 2048 (Aug. 23) 1929.

3. Williams, L. L., Jr.: Current Malaria Studies, with Special Reference to Control Measures, Pub. Health Rep. **44**: 2001 (Aug. 16) 1929.

that malaria could be controlled; Gorgas, Carter, Von Ezdorf and LePrince demonstrated practical control on a large scale; the health departments of the Southern states have secured malaria control in practically every urban community of any size in their states; it now remains, Williams adds, to secure it in every rural section. We have weapons with which to attack the parasite, to prevent the access of mosquitoes to man, and to prevent the production of *Anopheles*. Whenever any or all of these measures become common practice in Southern counties, he concludes, malaria will disappear.

Current Comment

THE CARBOHYDRATE COMPLEX OF SERUM PROTEINS

It was surprising news, a few years ago, to students of immunologic problems that pathogenic organisms can yield soluble specific substances that are carbohydrate derivatives of relatively simple structure. Prior to the pioneer work of Heidelberger and Avery of the Rockefeller Institute for Medical Research in this field, the proteins were the substances almost exclusively endowed with immunologic potentialities. Much justification for this attitude, of course, still remains. The denaturation of many proteins promptly deprives them of antigenic properties. Mild hydrolysis with enzymes or other chemical agents renders most proteins inert as factors in the phenomena of anaphylaxis. The characteristic amino-acids yielded by proteins are devoid of any specific reaction, resembling the remarkable effects obtainable by the use of the proteins that furnish these characteristic nitrogenous "building stones." A possible explanation of the apparent contradictions may be found in the recent demonstration by Rimington[1] of Leeds, England, that a carbohydrate complex is one of the structural units present in both the albumin and the globulin of horse serum. This is not the first time that biochemists have claimed that they have demonstrated the presence of carbohydrate groups in proteins other than the complex glycoproteins, such as mucins, that admittedly yield sugar compounds. The older announcements, dating back to the last century and asserting that glycosamine could be obtained from both egg and serum proteins by appropriate chemical disintegration, were usually subjected to the criticism that the starting material had not been adequately purified. The implication that carbohydrate occurs in simple proteins merely as an impurity can apparently no longer be justified in every case. Rimington has secured quantities of constituent carbohydrates amounting to 2 per cent of the purified serum proteins, the derivative sugars being identified as glycosamine and mannose. Of course this need not imply that all proteins are similarly constituted; but the suggestion that immunologic properties of some proteins are bound up in carbohydrate constituents now becomes an engaging problem.

1. Rimington, C.: The Isolation of a Carbohydrate Derivative from Serum Proteins, Biochem. J. **23**: 430, 1929.

UNDULANT FEVER

Either undulant fever is rapidly increasing in this country or, as is perhaps more likely, our knowledge of the occurrence of this disease is making rapid strides. Last year in the United States 367 cases were recorded and it can scarcely be doubted that many more escaped record. Diagnosis is by no means simple apart from the agglutination test, the symptoms being readily confounded with those of typhoid. During the twelve months from April 1, 1927, to April 1, 1928, all blood sent for the Widal test to the Danish Serologic Institute was examined for agglutination of *Brucella abortus*. A positive agglutination in a dilution of 1:100 was found in more than 10 per cent of the specimens thus submitted from 2,150 patients.[1] Wherever routine laboratory search has been made, a surprising incidence of the disease has been discovered. On the other hand, in Great Britain, where the seventh human case was only recently recorded,[2] interested physicians are demanding that blood tests be made in all cases of pyrexia of unknown origin. Even the "undulant" character of the fever is not to be relied on for diagnosis. Among forty-five cases reported in New York State during the last year, it is stated that in no less than sixteen cases the disease was not undulant in character.[3] The fact that two thirds of the victims were men is considered a "striking feature" of this report; it is characteristic of the disease, however, that the incidence should be higher in males than in females. In the Danish experience[1] males outnumbered females by 160 to 49. Hardy,[4] reporting on the same disease in Iowa, records ninety-eight males to twenty-seven females. Of twenty-seven cases reported recently in Schleswig-Holstein, twenty-one were in males.[5] All observers are agreed that the disease is much more common in middle life than it is in childhood or old age. Since old and young, male and female, are alike exposed to the hazard of drinking raw milk, the excess morbidity of middle aged men may be perhaps related to the occupational hazard to which attention has already been drawn.[6] Of the twenty-seven patients in Schleswig-Holstein,[5] ten were farmers or farm laborers, two bailiffs, one a veterinary surgeon, one a physician, one a slaughterer, and twelve followed other occupations. Clark[7] has pointed out that there are really two types of human undulant fever in this country: one due to infection with *Brucella melitensis* A, which is usually caused by drinking raw milk, and the other due to *Brucella abortus*, which is contracted also in other ways, such as by removing a cow's placenta or by killing pigs. A specific treatment of this disease is not yet available. The use of serums has proved disappointing. Vaccines have given more

1. Madsen, T.: La fièvre ondulante à B. abortus du Danemark, Bull. Office internat. d'hyg. pub. **20**: 1395, 1928.
2. Thompson, T.: Bacillus Abortus Infection in Man, Lancet **2**: 1335 (Dec. 29) 1928.
3. Undulant Fever in 1928, Health News **6**: 137 (Sept. 2) 1929.
4. Hardy, A. V.: Undulant Fever: A Clinical Analysis of One Hundred and Twenty-Five Cases, J. A. M. A. **92**: 853 (March 16) 1929.
5. Weigmann, F.: Über menschliche Infektionen mit Bacterium abortus Bang und ihre Verbreitung in Schleswig-Holstein, Klin. Wchnschr. **8**: 351, 1929.
6. Undulant Fever: An Occupational Disease, Current Comment, J. A. M. A. **92**: 150 (Jan. 12) 1929.
7. Clark, T.: Sur la fièvre ondulante aux Etats-Unis, Bull. Office internat. d'hyg. pub. **20**: 1394, 1928.

encouraging results according to recent reports from the continent. In particular, an antigen prepared from dried *Brucella abortus* has seemed efficacious in a small number of cases.[8] In this country Hoffman[9] has suggested the use of acriflavine hydrochloride, which he feels has shortened the duration of the disease in some of his cases. All attempts to shorten this tedious and exhausting infection deserve encouragement. Until more experience has been gained, however, symptomatic treatment directed chiefly against fever, pain and the secondary anemia of the later stages of the disease is the method of choice.

THE NORMAL CARDIAC OUTPUT OF MAN

The output of blood from the heart is the foremost factor in maintaining the circulation. It is doubtless related to the need of oxygen, a physiologic feature that varies greatly with the work in which the body may be engaged. There are measurements to indicate that the difference between rest and severe exercise may involve changes as large as 1,000 per cent, the latter figure representing a cardiac output of 30 liters of blood per minute. For an organ as small as the heart, this is indeed a remarkable performance. Accurate knowledge of the heart's output under standard conditions of health is obviously desirable, for from this the consideration of the cardiac reserve or the ability of the heart to increase its output must start. Its importance in the consideration of cardiac disease need not be stressed here further. Unfortunately, the methods for estimating cardiac output in man have not been convenient or always trustworthy. The procedure instituted by Grollman[10] at the Johns Hopkins University Medical School has eliminated most of the errors and reduced the difficulties. By the use of the new method he has made measurements on the largest series of healthy persons yet reported. The number is sufficiently large and of a degree of accuracy to permit the evaluation of the normal cardiac output of man. The data also are evidence for the constancy of the cardiac output of man and the possibility of predicting a value for the normal individual. This ability to predict the cardiac output is particularly important for the clinical applications of determinations of the cardiac output, Grollman believes, for it permits one to compare a given determination with the average normal value and thus conclude as to the degree of its abnormality. Grollman's figures for fifty-one persons in the resting, basal condition indicate that, like the basal metabolism, the heart output of normal men and women is a function of their surface area and can be predicted with a high degree of accuracy. The cardiac output per square meter of body surface under fixed standard conditions was found to be 2.2 liters a minute. For the average sized person this represents about 3.8 liters of blood a minute. From this one may readily calculate that, day by day, the heart of a person at bodily rest must eject several thousand liters of blood. Like the maintenance of body temperature, this is a fairly fixed function in health; when the performance becomes impaired or upset, serious physiologic embarrassments are likely to ensue unless some compensatory factors intervene.

8. Cambessédès, H., and Garnier, C.: Paris méd. **1**: 281 (March 23) 1929.
9. Hoffman, A. M.: Treatment of Undulant Fever with Acriflavine, J. A. M. A. **92**: 2169 (June 29) 1929.
10. Grollman, A.: Physiological Variations in the Cardiac Output of Man: VI. The Value of the Cardiac Output of the Normal Individual in the Basal, Resting Condition, Am. J. Physiol. **90**: 210 (Sept.) 1929.

ELECTIVE LOCALIZATION OF BACTERIA

Loss of faith in any basic hypothesis results naturally in skepticism as to the value of methods and practices originally developed from the hypothesis. That such a reaction now seems to be taking place in practical immunology is illustrated by a changing professional attitude toward Rosenow's theory of elective localization of bacteria in the animal body.[1] This alleged specific localization has been continuously opposed by professional immunologists, mainly because it appeared inconsistent with the traditional tenets of their science. Assuming that somatic antibodies constitute the major antimicrobic defense of the body, that these protective hormones are developed from some thus far unidentified antimicrobic center or tissue and are therefore chemically identical in all organs and tissues of the body, orthodox serologists could not picture sufficient differences in local tissue defense to account for an 80 per cent elective localization of one strain of intravenously injected streptococci in the kidney, for example, with an almost equal dominant localization of a second strain in some other organ or tissue. The known or assumed differences in oxygen tension, hydrogen ion concentration, and similar factors did not seem sufficient to account for this alleged phenomenon. The present transitional immunology questions the traditional concept that somatic "antibodies" are the major antimicrobic defense of the body. It recognizes different protein specificities in different tissues and organs and therefore is receptive to the suggestion that there are qualitative as well as quantitative differences in intracellular chemical defenses.[2] It even turns a receptive ear to the heretical suggestion that micro-organisms may be biochemically "hybridized" with local tissue proteins and thus altered in their immunologic specificity. Hence modern immunology finds no difficulty in imagining a sufficiently exalted specific tissue virulence, with a less exalted virulence for the body as a whole, to make specific localization inevitable. Perhaps the "Rosenow heresy" will become the accepted orthodoxy of the future. Future epidemiology may even picture an accidental infection of the spinal cord with an indifferent streptococcus as the starting point of an epidemic of poliomyelitis.

1. Rosenow, E. C.: Elective Localization of Bacteria in the Animal Body, in the Newer Knowledge of Bacteriology and Immunology, University of Chicago Press, 1928, chapter XLIII, p. 576.
2. Manwaring, W. H.: A Critique of the Ehrlich Theory, with an Outline of the Enzyme Theory of Antibody Formation, in the Newer Knowledge of Bacteriology and Immunology, chapter LXXXI, p. 1078.

Emergency Treatment of Fractures.—One of the fundamental rules of modern fracture treatment is that the part must be splinted from the moment of injury. The motto should be "Splint them where they lie." This rule should apply to all types of bony injuries, at least until x-ray evidence of the exact nature of the fracture has been obtained. Early splinting is particularly necessary in the case of fractures of the shafts of long bones.—Wilson, P. D., *J. Missouri M. A.*, November, 1929.

Association News

THE DETROIT SESSION

Application Blanks for the Scientific Exhibit

Circular letters containing the information on the Scientific Exhibit for the 1930 session, together with the application blanks, will be mailed during the first part of December. Any who desire to receive the circular letter and application blank should mail a request to the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago. The Committee on Scientific Exhibit requires that all applications for space must be made on the regular application form.

MEDICAL BROADCAST FOR THE WEEK

The American Medical Association Morning Health Talks and Evening Health Hints from Hygeia

The American Medical Association broadcasts daily at 10 o'clock, Central Standard Time, with the exception of Friday, when the health message is delivered at 9:45, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week of November 11-16 is as follows:

November 11. "What People Want to Know About Their Health," by Dr. R. G. Leland.
November 12. "Medical News," by Dr. J. F. Hammond.
November 13. "The Control of Pernicious Anemia," by Miss Lois Stice.
November 14. "Aladdin's Lamp for Each of Us," by Dr. R. G. Leland.
November 15. "The Need for State Lye Legislation," by Mr. J. W. Holloway.
November 16. "Physical Fakes," by Mr. H. J. Holmquest.

Evening Health Hints from Hygeia, 8 o'Clock, Central Standard Time

November 11. Safety First.
November 12. Current Disease Statistics.
November 13. Persons with High Blood Pressure.
November 14. Music Helps Crippled Children.
November 15. Be Sure Your Baby Has a Birth Certificate.
November 16. Iodized Salt Prevents Goiter.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

Medical and Surgical Association of the Southwest.—Dr. Leo Eloesser, clinical professor of surgery, Stanford University School of Medicine, San Francisco, addressed the fifteenth annual meeting of the Medical and Surgical Association of the Southwest at Phoenix, November 7-9, on "Treatment of Bronchiectasis," and Dr. William Dock, assistant professor of medicine at Stanford, on "Some Details of the Treatment of Heart Disease." Dr. John V. Barrow, professor of clinical medicine, College of Medical Evangelists, Los Angeles, gave a moving picture demonstration of human intestinal protozoa; other features were clinics each day, a number of addresses by physicians from southwestern cities, and a program of entertainment.

ARKANSAS

Society News.—The Mississippi County Medical Society was addressed recently by Drs. E. V. Hill on "Care of Children During Preschool Days"; Joseph A. Saliba, "Frontal Sinus Infection," and R. Bowen, "Problems of Interest to the Child."——Dr. Thomas Douglass, Ozark, has been elected president of the Tenth District Medical Society.——The Lawrence County Medical Society was recently addressed by Dr. Wright W. Hatcher on "Typhoid Fever."——The Ouachita County Medical Society was recently addressed by Dr. Joseph H. Sanderlin, Little Rock, on "Chronic Endocervitis," and by Dr. Alexander C. Kirby, Little Rock, on "Diarrheas in Children."

CALIFORNIA

Licenses Revoked.—At a meeting of the state board of medical examiners in Sacramento, October 22-24, the license of Dr. Robert C. Kirkwood, Benson, Ariz., to practice in California was revoked for unprofessional conduct and violation of subdivision 6, section 14, chapter 354, under the statutes of 1913. The board also revoked the license at this meeting of Dr. Thomas O. Greig of Berkeley.

Loan Fund for Students.—An anonymous donor has pledged $10,000 to the University of California Medical School to be paid in forty semiannual sums of $250 to establish a student loan fund in memory of Dr. Edith S. Brownsill, and the first check accompanied the pledge. The donor requests that the loans to students should not exceed $250 per person each semester, and that the sum be repaid by the student not later than six months after he completes his internship. Interest at 6 per cent per annum from the date of graduation or withdrawal from the university will be charged.

"Dr." Button Fined for Advertising.—Albert Carter, special investigator for the state board of medical examiners, filed a complaint, October 7, charging Annabel Button of East Bakersfield with advertising in violation of the medical practice act. Annabel pleaded guilty and was fined by Judge Davis to ninety days in jail, the sentence being suspended on condition that she stop advertising as a physician as well as treating the sick until she has obtained a license. The defendant, a "chirothesian," is said to treat any disease except cancer and venereal disease. Her name appeared in the telephone directory with the prefix "Dr."

An Evening of Moving Pictures.—The San Francisco County Medical Society will present a program of moving pictures at the regular meeting, November 12, under the auspices of the Pacific Institute of Tropical Medicine of the University of California. The pictures will be in three parts: (1) poisonous snakes of the United States with method of antivenom production and treatment of snake bite; (2) moving pictures of the hookworm showing its life history, importance, treatment and prevention; (3) moving pictures illustrating the life history, transmission, treatment and prevention of malaria.——Dr. Lewellys F. Barker, Johns Hopkins University School of Medicine, Baltimore, will lecture at the University of California Medical School, November 25-December 24, and will hold clinics daily from noon to 1 p. m. at the University Hospital, Parnassus and Third Avenue. Members of the San Francisco County Medical Society are invited.

Personal.—Dr. Lewis Gunther has been appointed assistant physician for men at the University of California.——Dr. Frank W. Stewart has become assistant health officer of Long Beach, succeeding the late Dr. Walter O. Howell.——Dr. Joseph W. Cook, Banning, was expected to sail from New York in October to be a medical missionary at Teheran, Persia. Dr. Cook, who formerly served in this missionary field, has been back in practice in the United States about twelve years.——Dr. Ina M. Richter has been promoted from instructor to assistant clinical professor of medicine at the University of California Medical School.——Dr. Charles E. Sisson, formerly of Talmage, has been appointed medical superintendent of the Napa State Hospital at Imola.——Dr. George Dock was elected first vice president of the California Tuberculosis Association, October 25, and Dr. Charles C. Browning, Los Angeles, secretary.——Dr. Frederick Eberson, assistant professor of medicine, University of California Medical School, San Francisco, has been appointed director of the clinical laboratory at Mount Zion Hospital on a part-time basis.——Dr. Roy M. Fortier has been appointed health officer of Monterey County. The former health officer, Dr. Roscoe C. Main, resigned to become health officer of Santa Barbara County.

ILLINOIS

Typhoid at Carbondale.—Fifteen cases of typhoid at Carbondale have been reported by the state department of health. While the investigation had not, on November 1, definitely established the source, the evidence pointed rather conclusively to its origin in the raw milk supply. Ten cases occurred in a manner indicating that all were due to a common source; nine of these were in regular customers of one raw milk distributor.

Chicago

Dr. Curtis Appointed Professor of Obstetrics and Gynecology.—The board of trustees of Northwestern University, by unanimous action, has combined the departments of obstetrics and gynecology, and has appointed Dr. Arthur H. Curtis as chairman and professor. Dr. Curtis graduated at Rush Medical College in 1905, was a Cook County Hospital

intern, and did graduate work in Vienna and Berlin. He is a past president and secretary of the American Gynecological Society, and has recently published a book on gynecologic diagnosis. Dr. Curtis has practiced in Chicago since 1909 and has held the professorship of gynecology since the death of Dr. Thomas Watkins.

Professor De Lee Goes to University of Chicago.—At a recent meeting of the board of trustees of the University of Chicago, Dr. Joseph B. De Lee was appointed professor of obstetrics and gynecology and chairman of the department for three years from October 1. Dr. De Lee for many years has occupied a similar position at Northwestern University Medical School. The Chicago Lying-In Hospital, of which he has been the medical director since its foundation, is now affiliated with the University of Chicago and a new building is being erected on the campus on the south side. Other appointments in this department at the University of Chicago include Dr. Fred L. Adair, Minneapolis, as professor of obstetrics and gynecology, and Dr. Eloise Parsons as assistant professor of gynecology. Dr. Howard J. Holloway has been appointed a clinical associate in obstetrics and gynecology at Rush Medical College. Dr. Rudolph W. Holmes has resigned as professor emeritus in the department of obstetrics and gynecology of Rush Medical College.

Society News.—Dr. Wendell C. Phillips, New York, Past President of the American Medical Association, addressed the Chicago Laryngological and Otological Society, November 4, on "Application of Medical and Social Science to the Problems of Acquired Deafness."——Dr. William C. Woodward, director, Bureau of Legal Medicine and Legislation, American Medical Association, addressed the South Chicago Branch of the Chicago Medical Society, October 29, on "What the Physician Should Know About Malpractice," and Dr. Anton J. Carlson, professor of physiology, University of Chicago, "Relation of the Sympathetic Nervous System to Metabolism."——An epidemic of seventy cases of Vincent's angina, or so-called trench mouth, was reported at the Spaulding School for Crippled Children, October 30.——Dr. Charles B. Reed, president of the Chicago Medical Society, on December 22 will give the last of a series of lectures which are being given by the Chicago Academy of Science in Lincoln Park on Sunday afternoons at 3 p. m. Dr. Reed's subject will be "Is the Doctor Responsible for the High Cost of Illness?" Dr. Fremont T. A. Chandler will give the December 8 lecture on "The Crippled Child"; Dr. Arnold H. Kegel gave the November 3 lecture on "Physical Defects in School Children."——Dr. G. Carl Huber of the University of Michigan Medical School, Ann Arbor, will deliver the first Stephen Walter Ranson Lecture at Northwestern University Medical School, 303 East Chicago Avenue, November 14, 8 p. m., on "The Regeneration of Peripheral Nerves." Members of the Chicago Medical Society are cordially invited.——The Chicago Orthopedic Club was addressed, November 8, at the Medical and Dental Arts Club by Drs. Beveridge H. Moore on "Bone Lengthening Operation" and Fred W. Hark on "Bifurcation Operations."——The Chicago Council of Medical Women will be addressed, December 6, at the Medical and Dental Arts Club by Drs. Irene T. Mead and Lena Sadler on colitis, and treatment of hemorrhoids, respectively.——The Chicago Gynecological Society will be addressed, November 15, at 50 East Erie Street by Dr. Géza de Takáts on "Treatment of Varicose Veins and Thrombophlebitis," and by Drs. Jacob Meyer, Julius E. Lackner and Sydney S. Schochet on "Paroxysmal Tachycardia in Pregnancy: Review of the Literature, with a Report of Two Cases."

INDIANA

Smallpox Epidemics.—Newspapers late in October reported twelve cases of smallpox at Greencastle which developed within a few days; one patient was a student at DePauw University. Other smallpox outbreaks in Indiana were reported from Bloomington, Warsaw, North Manchester, Laketon and Putnamville.

Dr. Berteling Honored.—The St. Joseph County Medical Society gave a dinner, October 9, at South Bend in honor of Dr. John B. Berteling, who has practiced in that city more than forty years. He has served as president of the county society and of the Indiana State Medical Association, and several times as a delegate to the American Medical Association. For several years he has been health officer of South Bend. The toastmaster was Dr. Charles Stoltz; among the speakers were Drs. Miles F. Porter, Fort Wayne; Hugh T. Montgomery and Jacob W. Hill of South Bend; William F. King, state health commissioner, and Father Cavanaugh of Notre Dame University.

Society News.—The Seventh District Medical Society, Martinsville, was addressed, October 29, by the president, Dr. Delbert O. Kearby, Indianapolis, and by Drs. Walter L. Portteus, Franklin, on "Puerperal Peripheral Gangrene"; James S. McBride, Indianapolis, new ideas in treatment of pulmonary tuberculosis and its complications; Leon Gray, Martinsville, "Menopause Arthritis"; Wendell D. Little, Indianapolis, "Use of Iodine in Toxic Goiter." Dr. Morris Fishbein, Chicago, editor of THE JOURNAL, spoke at the dinner on "Fads and Quackery in Medicine." The morning was given over to golf.——The Miami County Medical Society was awarded the Reed trophy recently for having the largest percentage of attendance at the annual meeting of the Eleventh Indiana Councilor District Society at Wabash. The next meeting will be at Kokomo in May.——The Howard County Medical Society, Kokomo, was addressed, October 9, by Drs. Walter W. Lee of the state board of health, and Herman Morgan, Indianapolis, on undulant fever and contagious diseases, respectively.——Dr. Albert M. Snell, Rochester, Minn., conducted a clinic before the Eleventh Councilor District Medical Association, October 17, and gave an address in the afternoon.——The Union District Medical Society was addressed at Connersville, October 31, by Drs. Clarence R. Strickland, on "Blood Vessel Pathology," William N. Wishard, "The Development of Prostatic Surgery," and Cleon A. Nafe, all of Indianapolis, on "Acute Appendicitis."——The Indianapolis Medical Society will be addressed, November 19, by Drs. Elmer Funkhouser and Henry F. Beckman on "Cardiac Arrhythmias" and "The First Stage of Labor," respectively, and on November 26 by Drs. James H. Stygall and John W. Carmack on "Diagnosis and Treatment of Lung Abscess" and "Mastoiditis with Gastro-Intestinal Disturbance in Infants," respectively.——Dr. Albert E. Sterne, Indianapolis, will address the Tippecanoe County Medical Society, Lafayette, November 14, on "Basic Training and Environment and Phases Peculiar to the U. S. A.," illustrated. The public is invited.

IOWA

Personal.—Dr. Edwin B. Godfrey, health officer of Webster Parish, Louisiana, has been appointed health officer of Sioux City on a full-time basis, a new position. He will succeed Dr. Martin J. Ryan, who has been acting as city physician on a part-time basis.——Dr. Fred H. Decker left Winterset, October 1, to take a position with the Mayo Clinic, Rochester, Minn.

Society News.—The Northwest Iowa Medical Society, Sheldon, was addressed, October 22, by Drs. Christian B. Luginbuhl, Des Moines, on treatment of goiter; Sidney A. Slater, Worthington, Minn., "Tuberculosis—Its Diagnosis," and George Donohoe, Cherokee, "Sex and Insanity."——At a joint meeting of the Marion and Mahaska county medical societies at Pella, October 9, among others, Drs. George L. Venable, New Sharon, spoke on "Lung Abscess," and Edward M. Williams, Oskaloosa, on "Acute Anterior Poliomyelitis."

Counties Having No Deaths from Tuberculosis.—Monona, Wayne and O'Brien counties of Iowa had no deaths from tuberculosis last year, according to a study by Dr. Howard A. Lanpher of the division of preventable diseases of the state department of health. Cherokee, Johnson and Mills counties had a tuberculosis death rate of over 100 per hundred thousand of population. The difference in counties may be partly accounted for by the fact that in those with high rates there are institutions which specialize in the care of tuberculosis patients, and in some are large cities where the opportunity for exposure to the disease is greater than in sparsely settled places. The tuberculosis death rate varies from year to year, but those counties which showed a low rate last year have had a low rate in previous years. The tuberculosis death rate for the entire state was 35 per hundred thousand of population last year, and that was the lowest in the history of Iowa.

Annual Conference of County Officers.—The Iowa State Medical Society held its fourth annual conference of county medical society officers at Des Moines, November 7. The program included a discussion of membership by the secretary, Dr. Tom B. Throckmorton; of finances by the treasurer, Dr. Robert L. Parker; of legislation by Dr. Thomas A. Burcham; of the county health unit by Dr. Daniel C. Steelsmith, and of laboratory service by Dr. Albert V. Hardy, Iowa City. Channing G. Smith, Granger, discussed the council; Dr. John F. Herrick, Ottumwa, the trustees; Dr. George C. Albright, Iowa City, the county secretary; Dr. Evan S. Evans, Grinnell, the deputy councilor, and Vernon D. Blank, teamwork. Dr. Morris Fishbein, Chicago, editor of THE JOURNAL, gave an address on "Present Trend of Medical Practice," which was followed by a symposium on state organization by Drs. Charles B. Taylor, Ottumwa, Oliver J. Fay, Des Moines,

and George B. Crow, Burlington, and by a symposium on "the county contract" by Charles W. Ellyson, Waterloo, Corwin S. Cornell, Knoxville, Clarence M. Wray, Iowa Falls, Clyde A. Boice, Washington, William W. Southwick, Marshalltown, William W. Bowen, Fort Dodge, and Attorney Vincent Starzinger.

MARYLAND

Memorial to Dr. Goldsborough.—A memorial service was held in Cambridge, October 20, marking the opening of a campaign to raise funds for a memorial to the late Dr. Brice W. Goldsborough, founder of the Cambridge-Maryland Hospital in 1898, one of the first institutions of its kind on the peninsula. Dr. Goldsborough was once president of the Medical and Chirurgical Faculty of Maryland. The memorial will consist of four fluted columns of Georgia gray crystal marble, with lily pond and fountain, topped with the insignia of the medical profession.

Personal.—James Allen Scott, Sc.D., of the staff of Johns Hopkins University School of Hygiene and Public Health, has accepted a research position in the public health laboratories at Cairo, Egypt.——James H. Brown, Ph.D., Johns Hopkins University School of Medicine, Baltimore, was awarded the honorary degree of doctor of science at the recent centennial celebration at Illinois College.——Dr. John M. Nicklas, medical director of the Maryland Tuberculosis Association, Baltimore, has joined the staff of the State Charities Aid Association of New York as field secretary for the committee on tuberculosis and public health.

Cancer Research in Baltimore.—A gift of about $5,000 a year for research on the cultivation of the cancer cell at Johns Hopkins Hospital has been made by the Chemical Foundation, New York. Francis P. Garvan, president of the foundation, announced a $10,000 gift for a research laboratory less than a year ago. The laboratory has been completed and work will begin at once. Dr. and Mrs. Warren H. Lewis and Mr. and Mrs. George Gey will take charge of the cultivation of cancer cells. Research is in progress toward finding a differential stain for the cancer cell, and on the intravenous treatment of cancer; the latter is being supervised by Dr. Ferdinand C. Lee, associate in surgery, and the former by Dr. Charles Geschickter. In addition to these funds, friends of Dr. Joseph Colt Bloodgood have contributed about $15,000 for research on cancer in the surgical pathologic laboratory.

The DeLamar Lectures.—The director of the Johns Hopkins University School of Hygiene and Public Health announced, October 12, that the following speakers will come to Baltimore to lecture under the Joseph R. DeLamar Lecture Foundation:

Dr. F. Park Lewis, New York, November 12, "The Adventure of Sightsaving."
Dr. Eugene L. Bishop, Tennessee state health officer, December 3, "Tennessee's Child Health Program."
Dr. Stewart Paton, New Haven, Conn., December 17, "The Art of Living."
Dr. Harry Gideon Wells, head of the pathology department, University of Chicago, January 7, "Relation of Heredity to Human Cancer."
Dr. Aldred S. Warthin, professor of pathology, University of Michigan Medical School, Ann Arbor, January 21, "Distribution of Latent Social Disease in the Population."
Dr. Milford E. Barnes, Rockefeller Foundation International Health Division, February 4, "Problems and Duties of a County Health Officer."
Dr. Peter K. Olitsky, Rockefeller Institute for Medical Research, February 18, "Studies on the Bacteriology of Epidemic Influenza."
Dr. Henry F. Helmholz, professor of pediatrics, Mayo Foundation, Rochester, Minn., March 4, "Preventive Pediatrics."
Henry B. Ward, Ph.D., professor of zoology, University of Illinois, March 18, "Spread of the Fish Tapeworm in the United States."

MICHIGAN

Personal.—Dr. Reed Wallace Teed resigned, November 1, as health officer of Owosso to devote his time to private practice.——Dr. Franklin T. Bower, Detroit, has accepted the directorship of the laboratory and roentgen-ray department at the South Mississippi Infirmary at Hattiesburg.

Society News.—Dr. Everett L. Bradley addressed the Oakland County Medical Society, Pontiac, on "Pain as an Indication for Cystoscopy."——The Jackson County Medical Society was addressed at its October meeting by Dr. Clifton F. McClintic, Detroit, on the treatment of chronic ulcers, gangrene, Raynaud's disease, thrombo-angiitis obliterans and spastic paralysis by alcoholic injection in the periarterial sheath.——Dr. Earl Miller is resigning as executive secretary of the Wayne County Medical Society on account of ill health, effective when his successor is appointed. The society was addressed, November 5, by Dr. Clark D. Brooks, Detroit, on "Factors of Safety in Goiter Surgery."

Convalescent Scarlet Fever Serum.—The Detroit Department of Health in the last year secured a quantity of blood from persons who had recovered from scarlet fever and gave the serum to physicians to give to scarlet fever contacts. Physicians receiving serum reported on its use to the health department. A study of the results indicates, it is said, that it is good practice to use convalescent serum for contacts. Among 266 contacts who had been exposed from eleven to twenty-eight days and who received convalescent serum, eleven secondary cases developed, while among sixty-nine contacts who had been exposed the same length of time and who had not received convalescent serum eighteen secondary cases developed. In the total group of 450 contacts exposed for various periods and who received convalescent serum only 2.9 per cent developed secondary cases, while among a total of 321 contacts exposed likewise and who had received no convalescent serum, 12.8 developed secondary cases.

What the Children's Fund Is Doing.—The first public announcement of the work of the Children's Fund of Michigan was made by the director, Dr. Hugo A. Freund, October 24, in an item in the Detroit *News*. The fund, established about seven months ago, has arranged to assist counties which are endeavoring to establish public health units by setting up child health demonstrations. It is hoped that the counties in question will be able in a few years to assume the financial responsibility themselves. The fund is lending aid to promote certain health provisions of benefit to children in other counties; it has undertaken a state-wide program to awaken the public to the necessity of oral hygiene, especially for the preservation of children's teeth; it has interested itself in the university's survey of the causes of dental decay, the state medical society's program of pediatric clinics for physicians, in a summer camp for children, in the problems of recreation and library extension, and in an investigation of behavior and delinquency. The fund intends to formulate a program looking to the establishment of mental hygiene in Michigan. A survey has already been started to determine what may be the best method of inaugurating child guidance clinics. Dr. Freund said that it had been necessary to deny assistance to numerous undertakings. The establishment of the Children's Fund of Michigan, for which Senator James Couzens, Detroit, created a $10,000,000 trust fund, was reported in THE JOURNAL, April 27, page 1456.

MONTANA

Committee on Traffic Accidents.—The Montana State Medical Association has appointed a committee to begin the study at once of traffic problems. It will report at the next annual meeting on the need of a compulsory liability insurance law for automobile traffic in Montana. The committee will investigate also the advisability of recommending a physical examination before licensing drivers. The committee comprises Drs. Ralph C. Holgate of Crow Agency, Albert D. Brewer, Bozeman, and Levi H. Huber, Livingston.

NEW JERSEY

Personal.—Herbert Marain, Jersey City, was the winner of the Fairchild Scholarship for graduate study in pharmacy, sponsored by the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy and the American Pharmaceutical Association.

Society News.—The Bergen County Medical Society was addressed, September 10, by Dr. Robert L. Dickinson, New York, secretary of the committee on maternal health, on "Various Problems in Birth Control, Contraception and Sterilization," illustrated with colored lantern slides.——Dr. Andrew F. McBride, Paterson, president of the Medical Society of New Jersey, addressed the Summit County Medical Society, September 13, on medical organization.——Dr. Louis H. Clerf, Philadelphia, addressed the Atlantic County Medical Society, Atlantic City, October 11, on "Suppurative Diseases of the Lung."——The Atlantic County Medical Society was to be addressed, November 8, by Dr. James C. Small, Philadelphia, on "Present Status of Rheumatic Fever and Its Treatment."——The Sussex County Medical Society celebrated its one hundredth anniversary, October 22, at a dinner dance at Pompton Lakes.——At the fifty-fifth annual meeting of the New Jersey Public Health and Sanitary Association, Asbury Park, December 6-7, the state entomologist, Thomas J. Headlee, will discuss mosquito control; Dr. Henry A. Cotton, medical director of the state hospital at Trenton, mouth infection; Abraham Epstein of the American Association for Old Age Security, old age pensions; Dr. Charles V. Craster, health officer of Newark, industrial hygiene, and I. R. Riker, state sanitary engineer, public outdoor bathing places. B. H. Obert, Asbury

Park, delivered the presidential address on "Some Public Health Aspects of Dispensing Foods and Beverages." Dr. Samuel L. Salasan, Atlantic City, was chairman of the meeting.

NEW YORK

Society News. — The New York State Medical Society arranged lectures by New York City physicians for members of the Genesee, Orleans and Wyoming county medical societies which were given in the Batavia High School Auditorium in October. Drs. Clarence de la Chapelle lectured on cardiac pathology; Arthur C. DeGraff, cardiac physiology; William Goldring, hypertension and hypertensive heart disease, and John H. Wyckoff, Jr., bacterial, rheumatic, syphilitic and arteriosclerotic heart disease.——Dr. Augustus B. Santry, Little Falls, has been elected president of the fifth district branch of the Medical Society of the State of New York.

Safety Banner Awarded to Rochester.—At the eighteenth Annual Safety Congress in Chicago, the National Safety Council awarded to Rochester a banner for maintaining a continuous record of sixty-two days without a motor vehicle fatality during the year ending August 31. Baltimore was given second place with twenty-two days, and Louisville, third, with forty-nine. Rochester's record was for 20,348,000 man-days without a motor vehicle death; Baltimore was for 18,268,800 man-days, and Louisville for 16,140,000 man-days. At this meeting of the council, C. E. Pettibone of the American Mutual Liability Insurance Company, Boston, was made president for the coming year, and W. H. Cameron, Chicago, managing director.

New York City

Studies on Transmitting Sound Over Light Beams.—John B. Taylor, consulting engineer of the General Electric Company, Schenectady, at a meeting of the New York Electrical Society, November 6, showed the developments in his studies on the transmission of sound over light beams. He is said to have demonstrated how a light beam can replace a telephone wire. The object of the New York Electrical Society is the interpretation of scientific discoveries.

Society News.—Dr. Aubrey T. Mussen, Baltimore, will address the section on neurology and psychiatry of the New York Academy of Medicine, November 12, on "The Cerebellum: The Method of Stimulation, and the Influence of the Localized Reactions in Determining the Course of Disputed Fissures, the Grouping of the Lobes, and the Exact Homology That Exists Between the Lobes and Fissures of the Cerebella of the Cat, Monkey and Man"; Sir William Wanless, Glendale, Calif., will address the section on historical and cultural medicine, November 13, on "Present-Day Medicine in India," and Drs. Ralph S. Bromer, Philadelphia, and Edwards A. Park, Baltimore, the section on pediatrics, on the bone lesions of congenital syphilis.

Progress in Diphtheria Immunization.—In the first nine months of 1929, a total of 165,265 immunizations against diphtheria were performed; of these nearly 50,000 were done by private physicians. In a report to the Diphtheria Prevention Commission, it is concluded that as a result of the administration of toxin-antitoxin since January the lives of 107 children in New York have been saved. In 1920, there were 1,045 diphtheria deaths. The health commissioner, Dr. Shirley W. Wynne, and Edward F. Brown, director of the Diphtheria Prevention Commission, forecast in their report that serious outbreaks of diphtheria will occur in 1932 and 1933. The forecast is based on a statistical analysis, which shows that diphtheria recurs in waves, the crest and valley of which occur with "unerring regularity" at intervals of about six and one-half years. The last wave in New York began to rise in 1926 and reached its crest in 1927.

Appointments in Hospital for Joint Diseases. — Nine appointments on the general service house staff will be made at the Hospital for Joint Diseases, Madison Avenue and One Hundred and Twenty-Third Street, four to begin in January and five in July, 1930. The hospital provides maintenance, uniform and a stipend of $25 a month. Graduating students and unmarried graduates of class A medical schools are eligible. The hospital has a capacity of 291 beds for acute diseases. The outpatient department treats about 800 patients a day. Graduates of the house staff are eligible to compete for the Frauenthal scholarship of $2,400 a year for a year's study in clinics of Europe and the United States, and for the two Brown Research Fellowships providing an award of $2,400 each. Applications should be handwritten and include information about education and experience and a letter of standing from the dean of the medical college. They should be addressed to Dr. Walter M. Brickner, chairman, house staff committee.

Ten Scholarships in Accident Prevention.—The president of the American Museum of Safety, Mr. Arthur Williams, announces that ten free scholarships at New York University in the course of accident prevention are available. There is a need for men with qualities of leadership in the safety movement. The number of persons accidentally killed annually has increased until it reached 97,000 in 1928, as estimated by the National Safety Congress. Students of the problem believe that the major cause of the accident situation is the lack of leaders in accident prevention. The course at New York University will be given evenings at the Washington Square branch in cooperation with the American Museum of Safety and ten industrial and commercial associations which will designate the scholarship students. The instruction will be practical as far as possible. The students will be taken to industrial plants of members of the museum of safety and to the various industrial associations, where they may observe the technic of accident prevention.

Health Centers and Fire and Police Stations.—Dr. Shirley W. Wynne, commissioner of health, in addressing representatives of about 100 health and welfare organizations, October 25, outlined the need for an extension of child health service, indicating that twenty health centers similar to the one recently approved for Harlem should be established throughout the city during the next few years. According to the New York *Times*, Dr. Wynne said that if the city could afford to build fire and police stations throughout the community, it could just as well establish public health stations where the need exists. The children of about 60 per cent of the parents in New York were said to depend on the city to protect their health. There are now maintained by voluntary agencies twenty-one preschool clinics. They serve only about 7,500 children, whereas the number to be reached is many times that figure. The meeting was called to consider the report of a special inventory of child health service conducted by the Welfare Council. Dr. Haven Emerson, who presided, urged the participation of private physicians in child health work. The report demonstrated, it is said, that Manhattan, which has more child health stations and clinics than all of the other boroughs combined, also has the highest infant mortality rate, 86.4 per thousand in 1928; the rate for the whole city was 65.5.

OHIO

Cincinnati Given Physiologic Laboratory. — With an anonymous gift of $130,000, the University of Cincinnati College of Medicine is constructing a laboratory of applied physiology on the campus at Eden and Bethesda avenues, directly behind the anatomy department. A new field of research will be carried on here dealing with problems that concern the application of physiologic laws to industry, including the protection of workers in dangerous chemical and metal industries, food contamination and ventilation. An annual gift of $30,000, also anonymous, provides for the maintenance of the laboratory.

Society News. — The Mahoning County Medical Society, Youngstown, arranged for a program, October 21, to be presented by Drs. Donald C. Balfour, Harold I. Lillie, Herbert Z. Giffin and William C. MacCarty, all of Rochester, Minn., during most of the day and evening. The $5 fee charged included the dinner.——Dr. Fred M. Douglass, Toledo, was elected president of the Northwestern Ohio Medical Association at the eighty-sixth annual meeting in Toledo.——Dr. John E. Hardman, Youngstown, won the first annual golf tournament of the Mahoning County Medical Society, October 10, with a low gross of 132 for twenty-seven holes.——About thirty Cleveland physicians have organized the International University Club of Ohio to promote cooperation between physicians of different nationalities and for the discussion of special scientific and social problems. The president is Dr. James Stotter, and the secretary, Dr. Emanuel Rosenberg.——At the annual dinner of the Summit County Medical Society, Akron, November 6, N. E. Hewitt, Chicago, of the American Vigilant Intelligence Federation, spoke on "Subversivism in the United States." The Doctors' Orchestra, composed of members of the society, furnished music.——At the annual meeting of the second councilor district of the Ohio State Medical Society, October 24, Dr. Frank H. Lahey, Boston, gave an address on goiter.——The Toledo Academy of Medicine and the Toledo Dental Society, jointly, were addressed, November 1, by Dr. Sherman Davis, Indianapolis, on "Morphologic Changes in Soft Tissues Found in Some Deficiency Diseases."——Dr. Frederick C. Holden, professor of gynecology, University and Bellevue Hospital Medical College, New York, will give ten lectures and three clinics in his graduate course in gynecology at the Toledo Academy of Medicine Building, the week of November 11, the fee for which will be $20.

Dedication of Institute of Pathology.—In 1926, the General Education Board appropriated $750,000 for the construction of an institute of pathology at Western Reserve University, Cleveland. The building was formally dedicated, October 7. The dedicatory address was given by Prof. Henry R. Dean, Cambridge University, England. The building was turned over to the medical school by Robert E. Vinson, president of the university, and accepted by the director of the Institute of Pathology, Dr. Howard T. Karsner. Western Reserve University on this occasion conferred the honorary degree of doctor of laws on Professor Dean and on Drs. William T. Councilman of Harvard University, Ludvig Hektoen of Rush Medical College, and Simon Flexner, formerly of the Rockefeller Foundation. The degree of D.Sc. was conferred on Dr. William H. Welch of Johns Hopkins University, he having received an LL.D. from Western Reserve in 1894. The institute, which is a five story and two basement structure communicating by tunnel with the nearby hospitals, nurses' home and medical school, is to be a central laboratory for the more intricate routine tests for all of the hospitals, and medical and dental schools of the university. The first floor is for the use of students who, except for necropsies, need to go nowhere else in the building for routine work. The second floor has the library, the office of the director and secretary, and the record and conference rooms. At the right of the doorway are bas-reliefs representing Morgagni, Virchow, Rokitansky and Pasteur, and at the left, John Hunter, Cohnheim, Bichat

and Welch. The central figure in the frieze above the door is the American caduceus under which is an open book with this legend from Claude Bernard: "Observation Shows and Experiment Teaches." Panels under the windows are motifs from the shields of medieval guilds. The frieze around the entrance hall shows the uncoiled snakes entwined in the pine trees. The lamp shades in the library are decorated with the trade marks of eight of the medical publishers. In the acknowledgments, it is said that the symbolic decorations would have been impossible without the aid of Lieut. Col. Fielding H. Garrison of the U. S. Army, A. H. Slade of the Library of Congress and the architects. The Metropolitan Museum of Art, New York, and the College of Physicians of Philadelphia assisted. The building committee of the faculty is deeply grateful to all officers of the university and others who played a part in the construction of the building.

PENNSYLVANIA

Hospital News.—The Uniontown Hospital Association, Uniontown, during the fiscal year 1929, provided 10,539 free days for patients in the hospital in a total number of 56,091 treatment days. About $24,000 was added to the endowment fund. The average duration of treatment was thirteen days per patient among the private patients and nineteen days among the charity cases. The cost per day per ward patient was $3.77 and for private patients, $4.90.

Philadelphia

The Mütter Lecture.—The College of Physicians of Philadelphia announces that Dr. Robert B. Greenough, assistant professor of surgery at Harvard University Medical School, Boston, will give the Mütter Lecture in Mitchell Hall, December 4, on "The Surgeon and Cancer."

Armistice Night.—The Philadelphia County Medical Society will give a dinner in its building at Twenty-First and Spruce streets, Wednesday evening, November 13, to celebrate Armistice Night. The speakers will be Surgeon Generals Merritte W. Ireland, Charles E. Riggs and Hugh S. Cumming of the army, navy and public health service, respectively, and Rear Admiral Jules Latimer, commandant of the Philadelphia Navy Yard. Reservations ($3 a plate) should be made with the executive secretary (Rittenhouse 0360). Seats will be reserved for members for the program if they are unable to attend the dinner.

Alvarenga Prize Awarded to Dr. Dorrance.—The College of Physicians has awarded the Alvarenga Prize for 1929 to Dr. George M. Dorrance, Philadelphia, for an essay entitled "Congenital Insufficiency of the Palate." The next award of the prize will be in July, 1930. Applicants may write on any subject in medicine. Essays should represent an addition to the knowledge and understanding of the subject based on research and must not have been published. They should be sent without signature but plainly marked with a motto and accompanied by a sealed envelop having within the name and address of the author. They must be received by the secretary of the College of Physicians of Philadelphia, 19 South Twenty-Second Street, before May 1, 1930.

Society News.—Frederick S. Hammett, Ph.D., addressed the Philadelphia Academy of Surgery, November 4, on "The Natural Chemical Stimulus for Cell Division," and Dr. Stanley P. Reimann on "The Use of the Natural Chemical Stimulus for Cell Division in Wound Healing."——The Obstetrical Society of Philadelphia was addressed, November 7, by Dr. Leopold Goldstein on "Amenorrhea During Serial Roentgen Exposures Due to Intervening Pregnancy," and by Dr. John C. Hirst II on modern aspects of backward displacements of the uterus.——The Philadelphia County Medical Society, through its committee on foods, drugs and beverages, has arranged a scientific program for Wednesday evening, November 27, when the speakers will be John R. Murlin, Sc.D., professor of vital economics, University of Rochester; Dr. Burrill B. Crohn, New York, and by Dr. Gordon J. Saxon.——The Philadelphia Psychiatric Society was addressed, November 9, by Dr. Gerald J. H. Pearson on "Children's Dreams and the Manner in Which They Contribute to the Understanding of the Child's Personality and Their Utilization as a Means of Treatment."

TENNESSEE

Society News.—Dr. G. Victor Williams, Chattanooga, was elected president of the East Tennessee Medical Association at the annual meeting in Lenoir City, and Dr. Jesse C. Hill, Knoxville, secretary, reelected. The spring meeting of the society will be held in Kingsport in May and the fall meeting at Cleveland.——The Memphis and Shelby County Medical Society was addressed, October 15, by Dr. Willard Bartlett, St. Louis, on "Respiratory Complications of Surgical Operations."——The Blount County Medical Society will be addressed, November 14, by Dr. Joe E. Hall, Greenback, on "Treatment of High Blood Pressure." The society was addressed, November 7, by Dr. Benjamin E. DeLozier, Maryville, on "Management of Malnutrition in Children," and October 31, by Dr. Samuel S. Kittrell, Louisville, on "Jaundice and Its Significance."——The Knox County Medical Society held an all-day meeting, recently, at the Whittle Springs Hotel, Knoxville; Drs. Robert F. Patterson, among others, spoke on "Treatment of Flexion Contractions of the Extremities"; Leon L. Sheddan on "Radical Operation for Cancer of the Breast with Special Reference to the Preservation of the Function of the Arm"; Robert H. Newman, "Eye Diseases of Systemic Origin," and Edward S. Clayton, Jr., "Spinal Anesthesia."——Dr. Lyle B. West has been elected president of the Chattanooga Surgeons' Club for the ensuing year.

GENERAL

Health at Fall River and Flint.—Telegraphic reports to the U. S. Department of Commerce from sixty-two cities with a total population of about 29 million, for the week ending October 26, indicate that the lowest mortality rate (7.4) was for Fall River, Mass., and for Flint, Mich., while the mortality rate for the group of cities as a whole was 12.2. The mortality rates for Fall River and Flint for the corresponding week last year were 6.2 and 8.1, respectively, and for the group of cities, 11. The annual rate for sixty-two cities for the forty-three weeks of 1929 was 13, as against a rate of 12.8 for the corresponding weeks of 1928.

Society News—Correction.—The recent announcement in THE JOURNAL of the new officers of the Medical Society of the Missouri Valley was, in part, erroneous; instead of Dr. John O. Skinner, Kansas City, being made vice president elect, it should have said that Dr. Edward H. Skinner, Kansas City,

was made president elect.——Dr. William D. Haggard, Nashville, Tenn., was made president of the Interstate Post Graduate Medical Association of North America at the Detroit meeting, October 25; Dr. Henry A. Christian, Boston, president elect, and Dr. Edwin Henes, Jr., Milwaukee, executive secretary and director of exhibits. The next annual meeting will be in Minneapolis.

International League Against Trachoma.—At the thirteenth International Ophthalmological Congress in Amsterdam and Scheveningen, September 5-13, the president called a conference of representatives of many countries to consider the trachoma problem as set forth by a report of delegates of the League of Nations. The representatives from the United States at this conference were Drs. F. Park Lewis, Buffalo; Walter R. Parker, Detroit; Charles Weiss, New York, and William H. Wilder, Chicago. The conference resolved to form an International League Against Trachoma, of which Dr. Emile de Grósz of Budapest was made president, and Dr. F. Wibaut, Amsterdam, secretary. They were entrusted to form a committee to elaborate ways and means and to communicate with the League of Nations and with the Rockefeller Foundation to endeavor to enlist their aid.

Radium Fund Presented to Madame Curie.—At a ceremony in the National Academy of Sciences, Washington, D. C., October 30, attended by officials of the diplomatic corps, government officials and scientists, President Hoover gave to Madame Curie a draft for $50,000 which had been raised in the United States by a few of her friends for the purpose of obtaining another gram of radium which Madame Curie, in collaboration with her late husband, discovered. As radium, it is said, is no longer produced in this country, the purchase will be made in Belgium. During her visit to the United States, Madame Curie attended the dedication of the Hepburn Hall of Chemistry at St. Lawrence University, Canton, N. Y.; participated in Detroit in the celebration of the golden anniversary of Thomas A. Edison's invention of the incandescent lamp, and was the guest of the New York committee of the American Society for the Control of Cancer at a dinner, October 31. These were said to be the only public appearances of our distinguished guest before she returned to France, November 8.

Official Reports of Death Rates.—The U. S. Department of Commerce has recently announced the annual mortality rates per hundred thousand of population for the year 1928 for the following states:

Louisiana, 1,281.4 as compared with 1,234.5 in 1927.
Nebraska, 970.2 as compared with 886.0 in 1927.
Oregon, 1,162.9 as compared with 1,146.7 in 1927.
Mississippi, 1,445.6 as compared with 1,295.8 in 1927.
Rhode Island, 1,172.3 as compared with 1,121.7 in 1927.
New Jersey, 1,176.7 as compared with 1,123.7 in 1927.
North Dakota, 859.8 as compared with 812.7 in 1927.
Virginia, 1,173.2 as compared with 1,130.1 in 1927.
Massachusetts, 1,189.6 as compared with 1,161.8 in 1927.
Tennessee, 1,255.2 as compared with 1,168.2 in 1927.
Colorado, 1,291.5 as compared with 1,218.1 in 1927.
Arizona, 1,359.5 as compared with 1,281.3 in 1927.
Wyoming, 872.5 as compared with 819.9 in 1927.
Maryland, 1,343.7 as compared with 1,321.4 in 1927.
Kentucky, 1,190.4 as compared with 1,072.1 in 1927.
Illinois, 1,219.5 as compared with 1,135.5 in 1927.

The reports from which these figures were taken give the specific death rates for a number of the diseases which largely account for the increase or decrease in the rate over that of the previous year.

National Birth Control Conference.—A national birth control conference under the auspices of the American Birth Control League will be held at the Hotel Astor, New York, November 18-20. The program Tuesday afternoon on birth control and health, will be presented by the following physicians: Ira S. Wile, associate in pediatrics, Mount Sinai Hospital; Shirley W. Wynne, commissioner of health; James L. McCartney of the Connecticut State Department of Health; S. Adolphus Knopf and Hannah M. Stone, medical director, Birth Control Research Bureau. The general subjects for other sessions will be (1) Birth Control and Race Improvement; (2) Birth Control and Social Welfare, and (3) Achievements and Plans of Birth Control Organizations. Tuesday evening a mass meeting will be held in the Engineering Auditorium, 25 West Thirty-Ninth Street, when the subject "Is Birth Control Immoral and Unsocial?" will be discussed by the Reverends Harry Emerson Fosdick, Henry V. B. Darlington and Stephen S. Wise. An informal reception at the home of Mrs. Thomas Lamont, 107 East Seventieth Street, to the speakers at the conference, physicians and members of birth control and welfare organizations will be held Monday at 5 o'clock. There will be no admission charge except for the luncheon, Tuesday. Cards will be required to attend the reception.

Bequests and Donations.—The following bequests and donations have recently been announced:

Methodist Episcopal Hospital, Philadelphia, $5,000 by the will of the late William A. Armstrong.

St. Luke's Hospital, Philadelphia, $11,000 by the will of Mrs. Mary A. Bernard.

Jewish Hospital Association, Philadelphia, $10,000 to endow a bed, and $500 each to the University of Pennsylvania Hospital, Jefferson Hospital and Temple University by the will of the late Harry L. Weinberger.

Hospital for Joint Diseases, New York, $500,000 for its convalescent home at Far Rockaway; Montefiore Hospital, $10,000; Mount Sinai, Lebanon, New York, and St. Joseph's hospitals at Far Rockaway, $5,000 each, and Har Moriah and Beth Israel hospitals of New York, $2,500 each by the will of the late Alfred M. Heinsheimer.

Wesley Memorial Hospital, Chicago, $25,000 and to share equally with the Old People's Home of Edgewater the residue of the estate of the late Mrs. Virginia J. Kent, who died, August 3, in Long Beach, Calif., and who had lived for many years in Evanston, Ill.

Stetson Hospital, Philadelphia, $20,000 by the will of the late Countess Santa Eulalia, mother of John B. Stetson, Jr.

Allentown Hospital Association, Allentown, Pa., and the Sacred Heart Hospital, Allentown, each $20,000, and each to receive the income of $50,000 by the will of the late Fred H. Sterner.

Priestley Forsyth Memorial Library, Northumberland, Pa., $22,450 by the will of Mrs. Frances Priestley Forsyth.

Philadelphia Home for Incurables, $3,000 by the will of the late Mrs. Annie Hudson Markley of Radnor.

Illinois Social Hygiene League, Chicago, Council of Social Agencies, University of Chicago, United Charities of Chicago, $5,000 each by the will of the late Charles H. Wacker, formerly head of the Chicago Plan Commission.

CANADA

British Accept Invitation to Meet at Winnipeg.—Next year the British Medical Association will meet in Winnipeg, Canada, having accepted an invitation from that city to meet there extended thirty-three years ago when the British Medical Association met at Montreal. The president-elect of the British Medical Association this year is Dr. William Harvey Smith, professor of ophthalmology at the University of Manitoba, who is also president-elect of the Canadian Medical Association.

Personal.—Drs. Russell D. Martin, Barrie, Ont., and H. A. Stuart, Sydney, volunteered to accept appointments in the far north with the department of the interior at Pangnirtung in Baffin Land, and at the mouth of the Copper Mine River. Their work will be in connection with the health of the Eskimos of those far northern regions.——Dr. Gordon P. Jackson has been promoted to health officer of Toronto, succeeding Dr. Charles J. C. O. Hastings, who resigned after about nineteen years' service.——Dr. Harry M. Speechly Winnipeg, has been appointed coroner of the province of Manitoba succeeding Dr. Daniel H. McCalman, resigned.——Sidney Bliss, Ph.D., has resigned as associate professor of biologic chemistry at McGill University, Montreal, to accept the chair of biochemistry at Tulane University of Louisiana School of Medicine, New Orleans.——Dr. Charles E. A. Trow, for nine years a practitioner in Shakespeare, Ont., has taken up the duties of ship surgeon on the *Lady Drake*, which runs between Halifax and British Honduras.——The honorary degree of LL.D. was awarded to Dr. Henry I. Taylor, minister of health of New Brunswick, at the recent commencement of the University of New Brunswick.——Dr. Thomas H. Whitelaw, for twenty-two years medical officer of health of the city of Edmonton, has resigned to engage in practice.——Dr. H. A. MacKeen, formerly a member of the teaching staffs of McGill University Faculty of Medicine, Montreal, and Tufts College Medical School, Boston, has been appointed assistant professor of bacteriology at Dalhousie University.

LATIN AMERICA

Personal.—Dr. Daniel M. Velez, Mexico, an associate fellow of the American Medical Association, who attended the meeting of the Association of Military Surgeons of the United States in Denver, September 26-28, presented the association with a Mexican banner and gold medals with the insignia of the Association of Military Surgeons of Mexico.

Epidemic of Psittacosis Among Actors.—Nine actors and actresses, including a widely known comedian of Argentina, became seriously ill in October with psittacosis or "parrot influenza"; October 20, it was reported that two had died. The diagnosis was at first difficult to establish, as the disease is rare. The death of a parrot, which had taken the part of a sailor's pet in a play, indicated the line of investigation to undertake. The Public Health Service of Buenos Aires reported that several persons had recently died of psittacosis in Santa Fe province.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 12, 1929.

Deaths from Coal Gas Poisoning: The Popular Method of Suicide

A committee appointed by the board of trade is holding an inquiry into coal gas poisoning. Dr. T. H. O. Stevenson from the general register office said that the number of deaths ascribed to coal gas poisoning in England and Wales had increased from a yearly average of 217 during 1911-1920 to 1,224 in 1928. The increase had occurred chiefly since the war and chiefly in suicides, the number of which had grown from 175 in 1918 to 1,086 in 1928. Accidental deaths had increased at the same time from eighty-one to 183. This form of suicide had only recently come into vogue. In 1901 there were only seven such deaths, but by 1910 the number had grown to 126—ninety-four males and thirty-two females. Nearly all the increase in suicides since the war had taken the form of coal gas poisoning, other forms of suicide having increased only slightly. The new realization of the convenience of gas poisoning seemed to have an effect, particularly in women. The commonest form of suicide in 1928 was coal gas poisoning with 1,086 deaths. Drowning came next with 959. Mr. F. W. Goodenough, secretary of the national gas council, said that the danger of fatal gas poisoning relative to other dangers arising out of the amenities of modern life had been seriously exaggerated. At the end of last year there were nearly 9 million individual gas supplies and the number of accidental deaths from gas poisoning was 130.

Reform in the Management of the Insane

The fifteenth annual report of the board of control (the body appointed by the government to control lunacy administration) deplores the fact that the poorer classes continue to be denied the facilities for voluntary treatment in the early and hopeful stages of mental disorder which are open to those in better circumstances. The board goes on to discuss available ways by which some overdue reforms may be instituted. Among these are clinics for outpatients carried on in association with general hospitals, and the addition to the staffs of mental hospitals of almoners responsible for seeing that patients, on discharge, are put in touch with those who will help them to find employment and to whom they can go for advice in the difficulties, domestic and financial, which often confront them. Many cases also require medical supervision. Quite apart from humanitarian considerations, it would be a sound business proposition if visiting committees had the power to employ a psychiatrist to visit and keep in touch with discharged patients. This experiment has been tried with marked success at Maasoord (Rotterdam), where the mental hospital serving the city has a much lower rate of admission than other Dutch hospitals in which the method is not followed. Gratifying results have been obtained in some hospitals from occupational therapy and the board would be glad to see occupational officers more generally appointed. The total number of notified cases of insanity in England and Wales on Jan. 1, 1929, was 141,080, which is 3.57 per thousand of population and an increase of 2,000 over last year. But the board does not consider that this represents an increase in the incidence of lunacy. Such factors as greater longevity of the patients, mainly due to better conditions, and the increase of the general population, especially the adult population, account for the increase. When the averages of the last quinquennium and of previous similar periods are contrasted, there appears to be ground for the repeated suggestion that the stress of modern life has resulted in an increase of insanity. But while the incidence of mental disorders presents nothing disquieting, it is to be regretted that the recovery rate over a long period has remained practically constant. The reason for this is difficult to determine. The rate for last year calculated on basis of the number of admissions was 30.84 per cent. But treatment in the early stages is considered a most encouraging advance which offers hope for improvement. Steady progress has been made in the process of hospitalization of the insane instead of merely confining them to institutions.

The Decline in the Birth Rate and the Supply of Juvenile Labor

The general decline in the birth rate during the war period will gradually reduce the supply of juvenile labor till about 1940. The lowest ebb will be reached about 1933, the figures for which will be nearly 20 per cent below those of 1927. The estimated number of juveniles aged from 14 to 17 years employed, or available for employment, is shown in the following table:

	Males	Females	Total
1927.....	1,249,000	926,000	2,175,000
1928.....	1,240,000	920,000	2,160,000
1929.....	1,231,000	915,000	2,146,000
1930.....	1,208,000	902,000	2,110,000
1931.....	1,163,000	866,000	2,029,000
1932.....	1,082,000	805,000	1,887,000
1933.....	1,007,000	749,000	1,756,000

In 1934 there will begin a rise and the figure 2,199,000 will be attained in 1937, but after that a decline will begin again, so that the figure for 1940 will be 1,923,000. This second decline is evidently due to the general decline in the birth rate independent of the war.

Salt Depletion by Sweating

At a meeting of the Institution of Mining Engineers, a series of reports was received on atmospheric conditions in hot and deep mines. Dr. J. S. Haldane and Mr. W. Hancock, the latter having experimented on himself in the large experimental chamber of the mining research laboratory at the University of Birmingham, presented an important paper on the acute attacks of cramp which occur among miners and others engaged in hard work in hot places when they drink water freely. In a man perspiring freely and replacing the lost fluid by water there is a tendency for the percentage of chloride in the blood plasma and in the whole body to fall, as much chloride may be lost in the sweat. The sweat glands seem incapable beyond a very limited extent of producing sweat, which, like urine, varies in composition according as water and other constituents are abundant or the reverse in the blood. Their function is to regulate loss of heat from the body or communication of heat to it. Only to a minor degree do they regulate the composition of the blood. Prevention of the symptoms due to excessive removal of chloride by sweating is simple; all that is needed is to provide a sufficient supply. By eating red herrings or highly salted bacon, coal miners usually prevent symptoms. If stokers in hot climates at sea would add one tenth of sea water to the water they drink during work, as the miner adds about 0.25 per cent to his water or tea, or would eat plenty of salt meat or fish, they would prevent symptoms.

The International Union for the Scientific Investigation of Population Problems

The International Union for the Scientific Investigation of Population Problems was constituted more than a year ago under the presidency of Prof. Raymond Pearl of Baltimore and has set up three important commissions on: (1) population and food supplies; (2) differential fertility, fecundity and sterility, and (3) vital statitstics and primitive races. In a letter to the *Times*, Bernard Mallet, a vice president, calls attention to the

importance of the union. It is to be supported by national committees in the various countries, which will focus the activities of workers and institutions concerned in one or another aspect of the population question. Such a problem, for instance, as that of the alleged overpopulation of this country and what would be an optimum population for the British Isles, taking into account the need for men of British stock in the empire, would be among the first which the British committee would consider. The committee was formed many months ago under the title of the British Population Society, and comprises many of the most eminent authorities in economics, statistics, biology and kindred sciences. It is backed by institutions such as the London School of Economics, the Royal Geographical Society and Royal Economic Societies, the Royal Institute of International Affairs and the Eugenics Society.

A Deadly Bacillus

Prof. Leonard Hill, director of the Department of Applied Physiology of the National Institute for Medical Research, in his presidential address at the annual conference referred to a deadly bacillus, whose name he did not disclose, but which, he said, was easily cultivated. If men were as susceptible as guinea-pigs were to the toxin produced by this bacillus, and there was reason to think they were, it would appear that 1 Gm. of the dry toxin would suffice to kill a million. The toxin acted if inhaled or if it fell on the eye as a powder. If men set out to prepare such a toxin and scatter it by airplane, what would be the use of the panoply of war? Was it not time, then, to end the waste of money on preparations for war, and apply the money so saved to preventing disease?

PARIS

(From Our Regular Correspondent)

Oct. 2, 1929.

Use of Pancreatic Extracts in the Treatment of Angina Pectoris

Several observers had noted that injections of insulin sometimes cause marked improvement in patients with angina pectoris. But the results of such treatment were annoyingly variable. This fact gave rise to the idea that the effects might be due not to the insulin itself but to some other substance associated with it and brought in through the preparation of that complex product. Pierre Gley and V. Kisthinos have succeeded in isolating from pancreatic extracts a substance lacking a glycolytic action—which is not a peptone, a choline, or a histamine, and which crude insulin extracts contain in varying proportions. When injected into an animal, it produces a manifest and rapid hypotensive action. It arrests frankly the hypertensive action of an injection of epinephrine. The effects of the substance are measured by taking as the standard a quantity which, when injected suddenly into the jugular vein of a rabbit weighing 2 Kg., produces a drop in the graphic sphygmomanometric curve. Trial treatments have been carried out with this substance by MM. Vaquez, H. Giroux and V. Kisthinos. There were twenty patients, fourteen of whom were affected with simple aortitis, and six with aortic lesions, with or without left ventricular insufficiency. Ten were suffering from angina pectoris following exertion and decubitus, and ten from angina due to exertion. Arterial pressure, while normal in thirteen of them, was frankly exaggerated in seven others. After receiving these injections, fourteen found that their attacks of angina did not return; six still retain some aortic sensitiveness. The effects of this substance, which the authors have termed "angioxyl," have been most frank, as is testified by the published observations. Rather often, the first injections cause a recrudescence of the pain, but that need cause no anxiety. The improvement appears with the fifth and sixth injection. It has been found inadvisable to go beyond ten injections, and this improvement has always proved lasting. The dose is 20 units per ampule, to be injected daily or every two days. In obstinate cases, two ampules should be given, and occasionally even three ampules a day. It is advisable, in order to maintain or confirm a cure, to take a series of ten injections, from time to time. Vaquez very prudently hesitates to speak, as yet, of permanent cures. But he states that no medical treatment (or surgical treatment, for that matter) of angina pectoris has given him, to date, such good and such rapid results.

The Foreigner Problem in the Hospitals of Paris

The foreigner problem, which for some time has occupied the attention of such hospitals, in the large cities of the provinces, as have limited funds, has become a very live question also in Paris, where the expense that the numerous hospitals add to the budget of the city of Paris is enormous and is constantly increasing. It is more particularly the Russians, the Poles, the Czechoslovakians and the Italians who impose a heavy burden on the budget, owing to their habitual lack of funds. Theoretically, the treatment of foreigners without funds is regarded in every country as a matter of reciprocity. But that conception results disastrously to France, which has scarcely 200,000 of its nationals residing in foreign countries, whereas it furnishes hospitalization to more than 3 million foreigners. In 1928, 22,233 foreigners were given care and treatment in the hospitals of Paris, which amounted to 337,706 days of hospitalization. This caused the Assistance publique an expenditure of 440,000 francs ($22,000). It has recovered from the home countries of patients 30,000 francs. These figures explain why the minister of health requests, from time to time, a statement of the expenditures made in behalf of foreigners by the hospitals. The citizens of foreign countries have a few dispensaries conducted by their own nationals, which lightens the financial burden somewhat but only slightly. The foreigners should establish more hospitals of their own. The patients themselves would be pleased to have about them nurses of their own nationality, or at least such as speak their own language. There is already in Paris a hospital for the citizens of northern Africa, which is giving a good account of itself.

The Assistance publique of Paris cannot recover the funds used for the benefit of foreigners. The state continues to declare that, by virtue of international understandings, France must, by way of reciprocity, give medical care to foreigners. The city of Paris sometimes makes an appeal to the consulates but seldom gets much satisfaction. Then, again, many foreigners of doubtful nationality do not seem to know to what consulate an appeal should be made in their behalf. A projected law dealing with the matter has recently been submitted to the minister of finance, for his approval. It looks as if the keynote of the law would be accepted. It brings all foreigners under the care of the French. Instead of a subsidy, the hospital services would receive legal aid. Thus, the municipalities and the state would contribute toward the cost of medical care for foreign patients. The Assistance publique would thus be relieved of the burden, but it would nevertheless be borne by the taxpayers. France has, however, no reason or interest in maintaining the regulations of conventions the conditions of which are so disadvantageous as this one. For example, 4,700 Italians were given medical care in 1928. The regulations of the conventions were applicable in only three of the cases. Furthermore, many of these foreigns were ill when they came to France, tuberculosis being especially common among them. The government's first act should be the improvement of the sanitary control at the frontiers, so that only immigrants in a sound state of body and mind would be admitted. Likewise, the bill proposed by Dr. Chauveau, senator, which would require foreigners entering the country to furnish a medical certificate, should be enacted into law. This certificate would be required for the securing of an identification card, and likewise the employer would be compelled to demand it. A better solution

still would be for all nations having in France many of their citizens belonging to the laboring class to provide the necessary funds for the creation of a hospital for their nationals, as Italy has decided to do at Marseilles. But, as a rule, countries are loath to make any expenditures for those citizens who have left the country and are no longer laboring in its behalf. The question might well be made the subject of an international agreement by the League of Nations at Geneva.

The American Hospice at Montfaucon

Ex-service men from the United States who recently made a pilgrimage to Montfaucon, the tragic spot in eastern France that was the scene of severe encounters, found there much evidence of the generosity of their compatriots. Not only has the village that was destroyed by shells been restored but there is also a model hospice presented by the state of Ohio, to which most of these American soldiers belonged. The hospice contains at present twenty beds, which number will later be increased. M. Tardieu, minister of the interior, attended in person the dedication of the hospice; likewise, General Haardt, military attaché of the American embassy in Paris, and Mr. Lawrence Norton, general secretary of the war monuments commission of the state of Ohio. Two hundred members of the American Legion participated in the ceremonies. In addition, a movement has been launched to lay out a broad avenue leading up to a lofty marble or granite shaft, to commemorate for all time the achievements of the Americans in this region.

BELGIUM

(From Our Regular Correspondent)

Oct. 5, 1929.

Light in Relation to School Hygiene

In the Oeuvre nationale de l'enfance, Dr. R. Ledent published an article emphasizing the unquestionable influence of sunlight in various domains: growth of children, development of the adolescent, aptitudes of the adult, preservation of diseases, and treatment of certain diseases such as tuberculosis. From the standpoint of school hygiene, it may be said that rickets presents, according to Woringer of Strasbourg, who collected statistics from many different parts of Europe, a minimum of frequency in June, July, August and September, whereas it increases from October to January and attains its maximum in February, March and April. In older children, general disorders of nutrition appear toward the end of winter and disappear in the spring: loss of appetite, flabby musculature, fatigability, anemia, lack of initiative, depression, nervousness and insomnia. It has been shown also that certain infections fear the sun, as angina, erysipelas, bronchopneumonia and meningitis.

From experiments that have been carried out (particularly by Schuyten), it is evident that the muscular strength of children, measured by the dynamometer, decreases from January to March; presents an ascending period from April to June; diminishes during the long vacation, and rises during the fourth quarter. The psychic activity of children is almost parallel to their physical activity. There is, then, a seasonal rhythm in the physical and psychic aptitudes of children, of which account must be taken—a rhythm that presents a certain parallelism with the luminosity of the atmosphere. Solar treatment, combined with exercise and respiratory gymnastics, should therefore be made the basis of all school hygiene.

The Association of Belgian Surgeons

The newly created Association des chirurgiens belges is designed to protect the professional interests of surgeons. Dr. De Beule is the president of the society. The constitution of the society will be drawn up by the provisional committee, which will ask the cooperation of the surgeons who appear to the committee to be especially competent as regards questions of social insurance, and also the aid of the presidents of occupational associations dealing with industrial accidents, urology, ophthalmology, otorhinolaryngology and gynecology. As soon as the necessary papers and the constitution have been prepared, a new general assembly will be convoked to select the members of the definitive committee and adopt the constitution.

The Farm-School at Waterloo

The Société médico-chirurgicale of Brabant recently held one of its meetings at Waterloo, at the farm-school, where Dr. Boulenger, the medical director of the school, explained to the visitors the activities of the institution. It is a provincial medicopedagogic institution for the care and instruction of abnormal children (weaklings, mental cases, imbeciles), who are, to a certain extent, educable by suitable pedagogic methods based on the principle of synthetic instruction and supervised liberty. All modes of activity are brought into use (manual training in the various trades, games) following a regular routine and discipline (gymnastics, scout activities). The education of the girls is carried out separately, being directed chiefly toward the care of the home. The farm-school is not only a center of application but also a center of research, which is accessible to all those who are interested in questions of a psychiatric and sociological nature pertaining to abnormal children. Medicopedagogic aid for epileptic children has not been worked out as yet.

After the presentation, Dr. Decroly called the attention of the members to the need of a better understanding and a closer relationship between teachers and physicians. In fact, not only abnormal children would benefit from excellent environmental conditions but also the supposedly normal children of our large cities. School hygiene will not be adequately solved except by a process of decentralization toward schools with open-air instruction. Pedagogy should depend more on medicine, which alone is able to give the guidance that it derives from psychology and physiology. The mental examination, which is the basis of all educative attitudes, should belong exclusively to the physician. Physicians would be doing wrong to hold themselves aloof from this important question. On the physician falls the duty of constructing the medicopedagogic bridge that will permit him to join his field of activity with that of pedagogy, which is necessarily incomplete.

The Belgian Society of Preventive and Eugenic Medicine

The first public meeting of the Société belge de médecine préventive et d'eugénique was held in the Palais du Cinquantenaire on the occasion of the *journées médicales*, Brussels' "medical week." The meeting was well attended, which testifies to the interest taken in the work of the society. M. F. Boulenger presided, and the three main topics on the program were the three questions that will constitute the activities of the society: the birth rate (including its social aspects); the periodic medical examination, and the prenuptial examination. In a short address, the president reviewed the past history of the Société d'eugénique, which has now changed its name, and set forth the ideas of the newly constituted society. Professor Couvelaire of Paris gave an interesting talk on antisyphilitic prophylaxis of future mothers. He pointed out that the prophylaxis must not be confined to the period of gestation but must be continued for a long time after birth; it must extend to the detection of syphilis if present in the father or in any direct relative. These principles were applied at the Maternité Baudelocque in Paris, where the mother, the father and the child were treated from the standpoint of tuberculosis as well as syphilis. This organization extends to all of France, for more than 400 maternity hospitals of this kind are in operation at present. Judging from the results secured thus far, it is believed that this collective and familial prophylaxis will not fail to reduce child mortality and to raise the birth rate.

THE PERIODIC MEDICAL EXAMINATION

Prof. J. H. Keiffer discussed the value of the periodic medical examination. In clear and precise terms, the speaker pointed out the principles of biology and physiology that lie at the basis of such an examination. He endeavored to establish the ages at which the preventive examination is the most opportune, and explained in a few words the technic of such examinations, taking account, at the same time, of the sanitary organization of the country.

THE PENUPTIAL EXAMINATION

Professor Péchère treated the subject of prenuptial examinations. It is the universal opinion that when two young persons enter into a marriage contract it is criminal for either one to conceal a disease or infirmity which, if it had been known, would have been regarded as an obstacle to the marriage. Legal sanction is the remedy that naturally comes to mind. But it is difficult to make such a solution practical. The examination that should be made before even an engagement is entered into has not yet become a recognized custom. The first thing to do, therefore, is to educate public opinion; to get people accustomed to the idea of a preventive medical examination, and to create such an interest in the subject that the masses themselves will demand such an examination as a legal obligation binding on both parties to the contract.

BUDAPEST

(From Our Regular Correspondent)

Oct. 4, 1929.

Social Aspects of the Venereologist's Work

Dr. Louis Nékám, professor of venereology at the University of Budapest, in a recent lecture critically reviewed the social efforts made by the medical profession in the interest of humanity. In recent times, he said, the tendency has been to take care of the individual. He quoted as examples infant welfare, maternity centers, the establishment of dispensaries and advisory bureaus, and health, unemployment and old age insurance. Of course, this is a great step forward; but by making the individual the object of protection and not the race, the individual has become more prone to crave comfort, to be tardy in founding a family, to marry for convenience, to turn to abortion, and to adopt the "one child" family system. Family feeling has degenerated, and along with it ideas of altruism and national spirit. The numbers of children have diminished, and the nation consists of loafing graybeards. Who, he asked, could talk today of training a strong, juvenile generation? The aim today is to lead a voluptuous sexual life without consequences, and hope to rejuvenate oneself by means of internal secretion concoctions, and so-called operations.

A pursuance of this path means the death of cultured nations. Their place will be occupied by the backward, less refined nations. A new migration of the peoples will follow, not as a wave, but as a gradual process, and the Orientals, Slavs, Semites and Malays will slowly advance into the Occidental countries. For that reason a clear insight into the future is needed, a policy aiming to erect barriers by means of the eugenic and puericultural development of the people. The leaders of this movement, which is necessary to save the Western nations, are those physicians who, besides caring for the body and curing disease, are also the apostles of spiritual ennoblement, sympathy for the masses, consciousness of duty, ascetic living, and civic self-sacrifice, and who endeavor to cure the people of their faults of character.

But is this a medical task? Yes, because a nation can be afflicted with diseases just as much as an individual, and no one can be a good healer of these diseases except one who has sprung from the people, has shared their misery and struggles, and is able to penetrate, reveal and clarify the mysteries of the people. The notion that people have to be helped runs through the whole history of mankind, but it has become a medical question only recently. In ancient times the victorious heroes simply exterminated the vanquished, so that nobody could interfere with the settlement of the conquering people. Later the legislators experimented: Moses encouraged the marriage of children in order that there should be as many offspring as stars in the sky. Plato and Lycurgus raised the pater familias to a high dignity and made bachelorhood a disgrace. The separation of sterile couples, the culture of the body, and erotic festivals passed, however, beyond the requisite limit; the means took the place of the object, and sensual pleasure became the primary aim instead of the procreation of children. Thence it was only a step to the rule of Phryne, and perversions which were followed by the deprivation of public life and the ruin of ancient Greece. The evolution of the newer European societies differs, depending on whether the peoples are engaged in agriculture or industry; for while landed property has decreased with the increase in the number of children, industrial earnings have not been diminished thereby. The depopulation of France commenced when the Revolution made a landowner of every man, while Dutch merchants even at present have families numbering from eight to ten children.

In our days the situation has been changed. Now the rich countries improve the quality of their people while the poor countries increase their quantity. In America and in the Scandinavian countries there are laws which protect the quality of marriages, examine couples that are to be married (even to testing the homogeneity of the blood groups), sterilize the unfit, periodically investigate the health of the population, insure life, create possibilities of obtaining work, award prizes to men of special strength, handsomeness and activity, educate their children, introduce the prohibition of alcohol and narcotics, and admit as immigrants only desirable elements of first-class races in order to improve their own race. It is quite different in some other countries. The Turkish, Bulgarian, Italian and French governments penalize bachelors with special taxes, make laws to compel men to marry, distribute bonuses to families with many children, attract foreigners to settle in the country, grant maternity aid, and encourage the propagation of children through national committees for the protection of childbirth.

The situation is difficult also in Germany, says Professor Nékám. Wise laws endeavor to promote the welfare of the people, to conquer diseases, to supply the public with good advice and to offset the ruinous influence of urban life. Bad housing, the difficulty of earning a living wage, foul air in crowded tenements, variety shows, revues and cinemas lead to coarsening, "fast" living, mass suggestion, homosexuality and alcoholism. Attention is now being paid to training the young, and laws, bureaus, unions and juvenile organizations are visibly improving the situation. Large families are partially supported by the state. Small plots of land at a nominal price have been made available where people can build themselves modest summer villas or lay out orchards or vegetable gardens. It is touching to see the people provided with free shows, recitals, concerts, festivals, reading rooms, sporting and excursion clubs, and to see the ways in which they are being taught and trained as useful citizens.

The creation of these beneficent institutions was a hard task and was largely the work of physicians. For instance, Bebel, the socialist apostle, regarded sexual life as a private affair, although there were 30,000 lunatics and 300,000 imbeciles in Germany. Prussia spends 100,000,000 marks yearly to counteract the degenerating and sterilizing effect of venereal diseases. It ought not to be forgotten that imbeciles, whose education is twice as expensive as that of normal persons, are a source of constant misery, because they are incurable, and prone to criminality and profligacy.

The data in Hungary are discouraging also, for the birth rate is rapidly declining. The rate has fallen from 34 per cent

to 26 in the last thirteen years. The situation is still worse in Austria, where the number of children born alive has fallen in four years from 30,444 to 23,078. The decline is qualitatively greater in Austria, as the number of legitimate children fell from 25,538 to 18,071. This means that at present every fourth or fifth child brought into the world in Austria is born out of wedlock. The general average, however, is not nearly so bad as that of Carinthia, Austria, where, in the deanery of Gurk, according to recent statistics, 80 per cent of the children born were illegitimate.

"Why do I tell you all this?" Professor Nékám asked. "Because I wish to impress on physicians that they should not become simply healing technicians, but take a wide view of the future, the present situation, and also the faults of the past, and because I consider it important that the editors of medical papers shall have in view the guidance and education of the people in medical matters." Physicians having the people's lot, mind and hearts should, the professor said, besides treating their patients conscientiously, agitate in three directions:

1. First and foremost, physicians should work in the interest of hygienic housing and the improvement of tenement conditions. In Hungary, where every hundredth man lives in his own house and where new couples cannot marry for want of dwellings, the question of housing conditions is a fundamental one. A housing law was introduced in England in 1875, in Saxony in 1896, and in Prussia in 1916. There is no such law in Hungary. In Paris regular records are kept of the hygienic state of every house, and every death from tuberculosis is followed by a reinvestigation of the house. In Budapest, in 1910, 272,000 persons lived in single rooms with three or four other persons, and 290,000 with five other persons; 164,000 families living in one room and kitchen apartments were renting their room to subtenants. The proportion of subtenants in Berlin is 8.4 per cent, in Vienna 10.5 per cent and in Budapest 15.1 per cent. Can morality, health, cleanliness, contentment and public safety be expected in Hungary under such conditions?

2. Physicians ought to exert themselves to improve the general morality. In former times feminists used to complain that there were two standards of morality: young men were allowed to live as they pleased, while they demanded virginity from the other sex. Now it is different. The newspapers daily record cases of immorality on the part of young girls; the modern tendency to drain life of its pleasures while the soul is at the same time destroyed by communistic principles has annihilated the moral work of centuries. The disparity existing between the natural and the old social laws is a regrettable fact. It is the task of physicians, therefore, to awaken sexual conscience, to proclaim the harmlessness of sexual abstinence, to denounce sexual promiscuity and the terrible prospect of venereal diseases, and to fight against the use of alcohol, which is frequently the occasion of immorality.

3. The third task of physicians is to do what they can to modify the effect of social and economic fluctuations. Periods of misery and of "boom" are alike perilous. There ought to be a guarantee of the staple necessities and after that the possibility of a modest living for every working family. A man who has unexpectedly become bankrupt is quite rightly embittered when he sees the provocative behavior and ostentation of the "newly rich." The Napoleonic wars, too, were followed by a general impoverishment, but we can set up as an example to ourselves the modesty and the frugality of the Biedermayer period, a century ago. The people spent more money in one way only—in the field of self-sacrifice and public generosity.

A physician is not only a healing worker; he is also a social expert whose field of activity is the whole national life. It is therefore his right and duty to raise his voice with a view to the solution of the important problems which were dealt with in this address, and compel people to listen to him.

BERLIN

(From Our Regular Correspondent)

Oct. 12, 1929.

Health Conditions in Germany

(Concluded from page 1400)

INCIDENCE OF SUICIDE

With the increased incidence of suicide in 1926, the figures for 1913 were exceeded in the 15-29 age groups of the men and in the 30 and above age groups among the women. In 1927, with the improvement in labor conditions, the incidence of suicide diminished, as compared with the previous year, especially in the older age groups. Table 1 shows the incidence of suicide in Germany and Prussia, for the years 1913 and 1926 and for 1926 and 1927, respectively.

TABLE 1.—*Number of Suicides per Ten Thousand Population in Germany and Russia*

Age Groups	Germany					Prussia	
	1913		1926		Combined		
	Men	Women	Men	Women		1926	1927
15 to 29 years..	3.5	1.5	4.1	1.5	2.8	2.7	2.6
30 to 59 years..	5.6	1.6	5.0	1.8	3.3	3.2	3.2
60 to 69 years..	10.1	2.5	9.2	2.7	5.8	5.7	5.0
70 and above...	11.3	3.0	11.1	3.4	6.7	6.3	5.8
All age groups taken together	3.5	1.2	3.9	1.4	2.6	2.5	2.4

As in previous years, in 1926 as well, the suicide figures were higher in the metropolitan areas (Berlin, Hamburg, Bremen and Lübeck), and in Lower Silesia, the Prussian Province of Saxony, the Free State of Saxony, Schleswig-Holstein, Thuringia, Oldenburg, Brunswick and Anhalt. On the other hand, in East Prussia, Upper Silesia, Westphalia, Bavaria, Württemberg and Waldeck the incidence of suicide was below the average for the *reich*. Differences in racial character and in conceptions of life itself appear to have caused this differentiation.

ALCOHOLISM, NICOTINISM, MORPHINISM

The annual consumption of beer is again increasing. In the fiscal year 1923-1924, the average consumption in Germany was 44.9 liters per person. In the fiscal year 1926-1927, it rose to 76.1 liters per person, and from April 1, 1927, to March 31, 1928, it showed a further increase to 80.8 liters per person, but even that figure does not come up to the prewar rate of

TABLE 2.—*The Birth Rate for the German Reich and the Large Cities of Germany for the Years 1926, 1927 and 1928*

	Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
The German reich.....	1926	20.8	20.3	19.0	18.1
	1927	19.5	18.9	18.0	16.9
	1928	19.6	19.0	18.2	....
The large cities of Germany.....	1926	14.7	14.7	13.8	13.2
	1927	14.1	13.9	13.0	12.6
	1928	13.9	14.0	13.3	13.2

102.1 liters per person. Likewise, the consumption of brandy is increasing. In the tax year 1923-1924, which extends from October 1 to September 30, the average brandy consumption per person (expressed in the form of 100 per cent wine spirits) was 0.58 liter. In the year 1926-1927 the average consumption rose to 1.35 liters, and in 1927-1928 to about 1.36 liters, which is, however, still considerably under the last prewar average of 2.80 liters. In arriving at an adjustment of these figures, it must be considered, on the one hand, that the territories ceded by Germany had a high alcohol consumption, but that, on the other hand, the percentage of children in the *reich*, who

consume a negligible quantity of alcohol but whose number affects the general average, has dropped from about one third to about one fourth of the total population. The number of patients treated for alcoholism in the German sanatoriums decreased greatly during the war and the postwar periods, but in recent years the number has again increased considerably. The last report shows also a marked increase in the consumption of tobacco. With an average population of about 63,250,000, there are approximately 105 cigars and 520 cigarets consumed annually per person. After deducting the children under 15 years of age and, with reference to the cigars, also the women of all age groups, it appears that the average number of cigars consumed by males over 14 years of age is about 300 and the average number of cigarets consumed by the adults of both sexes is about 700.

The number of persons treated in the sanatoriums for nervous and mental diseases by reason of morphinism and addiction to other narcotics, which in the prewar period amounted to about 500 annually, has risen from 1,283 in 1923 to 1,623 in 1925 and to 1,710 in 1926. One must be cautious, however, in concluding that there must have been an increase of addicts since the inflation period, for it must be considered that the more strict control of the sale of narcotics, since the war, seems to have caused many morphine addicts of the war period (and especially of the inflation period) to enter sanatoriums for withdrawal treatment, owing to the increasing difficulty and the greater expense involved in procuring narcotics.

TABLE 3.—*The Mortality Rate for the German Reich and the Large Cities of Germany for the Years 1926, 1927 and 1928*

	Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
The German reich.....	1926	13.3	12.0	10.5	11.1
	1927	14.7	11.4	10.2	11.5
	1928	12.9	12.1	10.4	....
The large cities of Germany.....	1926	11.5	10.1	9.1	10.2
	1927	13.1	10.1	9.0	10.6
	1928	11.9	10.8	9.2	10.3

In concluding the report on the health conditions of Germany in 1927, the writer takes a forward look into the year 1928. The health conditions in 1927, as revealed by the foregoing statements, may be regarded, on the whole, as satisfactory, and, as far as can be judged from the reports for 1928 that are available, the favorable conditions appear to have been carried over into the succeeding year. In the first half of 1928, the birth rate scarcely changed, while in the second half—at least, in the metropolitan areas—slight increases were recorded. According to preliminary reports, the birth rate for the *reich* and for the large cities of Germany was as shown in Table 2.

Also the mortality for 1928 shows slight changes over 1927. The mortality rate per thousand population, and figured on the annual basis, is shown in Table 3.

The mortality peak of the previous year, due to the epidemic of influenza, was lacking in the first quarter of 1928. The preliminary mortality figures for the second and the third quarters show a slight increase in the death rate, while the fourth quarter (in the large cities) shows a slight decline.

The infant mortality rate for 1928 shows a further decline. Table 4 shows the number of deaths per hundred living births for the first year of life, in Germany.

Also the mortality of children of preschool age appears to have declined further, whereas the number of deaths of school children (at least, in the large cities, from which statistics are alone available thus far) is somewhat greater than in 1927, a phenomenon that is doubtless due to the better school attendance in the age groups that have recently reached school age. The mortality in the remaining age groups appears to correspond closely to the death rates for 1927.

On the basis of the reports of the public health services throughout the German *reich* and the statistics on the causes of death submitted by the large cities of Germany, it may be stated that, as compared with the year 1927, the number of deaths from influenza was much less; also a decrease in the number of deaths from pneumonia and diseases of the respiratory organs may be noted.

On the other hand, in the first quarter of 1929 there was again an unusually high incidence of influenza, which, at least

TABLE 4.—*Number of Infant Deaths per Hundred Living Births for the First Year of Life, in the German Reich and in the Large Cities of Germany*

	Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
The German reich.....	1926	10.8	9.9	10.0	9.7
	1927	11.1	9.2	8.8	9.6
	1928	9.5	9.0	8.5	...
The large cities of Germany.....	1926	10.4	8.3	8.6	8.9
	1927	10.3	8.4	7.9	8.8
	1928	9.8	8.4	8.0	8.2

in a number of cities, exceeded the incidence of the epidemic of 1927. For example, the local health insurance society *(ortskrankenkasse)* of Berlin received, during the period from Jan. 13 to Jan. 19, 1929, notices of 8,366 cases of influenza or 18 per thousand members, whereas the largest number of new cases in one week, during the influenza epidemic of 1927, among the members of the same *krankenkasse,* was only 5,668 (Jan. 9-15, 1927). Also the influenza mortality of the epidemic of 1929, in spite of its comparatively benign course, exceeded that of the epidemic of 1927.

The tuberculosis mortality, according to the preliminary reports from the large cities, has declined still further. The tuberculosis mortality for the large German cities, figured on an annual basis, is shown in Table 5.

With reference to children's diseases, the incidence of scarlet fever increased considerably in 1928. The number of cases rose to 121,752 (an increase of about one third over 1927), while the number of deaths reached 1,079, or an increase of only 12 per cent as against the record for 1927. The disease presented, therefore, a further decline in virulence as compared with recent years. Also the diphtheria cases increased up to 41,160 (almost one fourth more than in the previous year); the total number of deaths was 2,380. While it is true that, in comparison to the prewar period, the nature of scarlet fever and diphtheria has been much less grave (in 1913, there were, within the territory of the German Empire, 6,062 deaths from scarlet fever and 12,258 deaths from diphtheria), nevertheless,

TABLE 5.—*Tuberculosis Mortality of the Large German Cities, for the Years 1927 and 1928*

Year	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1927.....	10.8	10.1	8.5	8.8
1928.....	10.3	9.8	8.0	8.2

the fact that, for a number of years, there has been a gradual increase in the morbidity of these infections demands the earnest attention of the health officers. Measles, in 1928, had a low incidence, while the number of deaths from whooping cough did not vary materially from the favorable record of the previous year. In contrast with the years 1926 and 1927, there was, fortunately, in 1928 no such pronounced autumnal increase in the morbidity of infantile paralysis. In 1928, there was a total of 998 cases (with 127 deaths) of that disease.

There were 6,880 cases of typhoid in 1928, or almost 600 cases less than in 1927, while the cases of paratyphoid showed

a slight increase. Also the morbidity and the mortality from dysentery, and likewise the cases of gastro-intestinal catarrh and of diarrhea, accompanied by vomiting, showed a slight increase in 1928, owing to the abnormally hot weather in July, 1928. Although the years 1926 and 1927 showed a decrease in the number of cases of puerperal fever, in 1928 there was an increase, the total number of cases having been 7,135. A closer analysis reveals that only the cases of childbed fever following miscarriage show an increase, while the number of cases following the births reported to the department of registration

TABLE 6.—*Number of Persons Killed or Injured, in the Berlin Area, During the Period 1926-1928*

Year	Number of Persons Killed	Number of Persons Injured
1926	111	5,744
1927	144	9,023
1928	216	11,755

remained unchanged. According to the statistics of the large cities, the deaths from heart disease, cerebral hemorrhage, and cancer showed a slight increase, doubtless due, in the main, to the increase in the representation of the older age groups in the whole population.

Of the deaths due to violence, the deaths from suicide in the large cities showed a slight decrease in 1928, so that the death rate from suicide in 1927, or 2.9 per 10,000 population, dropped to 2.7 in 1928. However, the deaths and injuries due to traffic accidents are increasing at an alarming rate. Table 6 gives the statistics for the years 1926, 1927 and 1928, for the Berlin area.

AUSTRALIA

(From Our Regular Correspondent)

Sept. 25, 1929.

Australasian Medical Congress (British Medical Association)

(Concluded from page 1401)

SILICOSIS

During the discussion at the meeting of the section of preventive medicine which followed the reading of a paper on "Silicosis and Tuberculosis" by Dr. Keith R. Moore of Canberra, Dr. Cumpston related some of his observations in silicosis. He concluded by saying that the important matter to decide from the point of view of public health was the stage at which a man became so silicotic that his condition was compensable.

Prof. H. G. Chapman of Sydney University said that he had had experience with Broken Hill miners, and it was his opinion that when a person suffering from simple silicosis could be diagnosed as susceptible to tuberculosis he was entitled to compensation.

Professor Chapman went on to say that he did not agree with those schemes of compensation that required a man to be taken out of the mines and put on a weekly pension until he found work again. Almost invariably such men never worked again. In fact, of the 400 men whom he knew to have been compensated in this manner, not one had found another job. The best method, he considered, was to compensate silicotic persons by the payment of a lump sum to enable men to change to another occupation. The amount of compensation should be based on the length of time the man had been employed in the mines and on the extent to which his capacity to earn a living had been diminished. That could be determined by heart tests, and tests of oxygen consumption after exercise. Young men suffered hardly any incapacity. The time men lived after contracting silicosis varied a great deal. One third of them contracted tuberculosis subsequently, and of this third one half died quickly and the other half slowly. About fifty of the Broken Hill miners who had gone elsewhere to engage in orchard work had died of heart failure.

Professor Chapman, in an earlier discussion of the paper, stated that his investigations did not support the theory put forward by certain investigators in South Africa that the fibrosis of the lung caused by finely divided silica was associated with a preexisting tuberculous infection.

Another speaker said that more light would be thrown on the nature of silicosis if roentgenograms could be compared with the actual condition of the lung tissue by means of postmortem examinations. As the disease was compensable, it should be possible to obtain more specimens of lung tissue after death.

STAMMERING

Addressing the section of neurology and psychiatry, Dr. Garnet Leary of Melbourne urged that attention should be given to stammering at an early stage. It was one of the tragedies of life, he declared, sapping vital energy and hindering the full development of native talents.

Stammering is more prevalent among English-speaking people than among others. The subject is much in need of sympathetic and well informed research. The high tension of modern life does not promise relief from the recurrence of this maladjustment; an inferiority complex consequently becomes established. The basis of developed stammering is fear, self-conciousness and anticipation of failure, with consequent psychic strain and storm. The stammerer is imbued with the idea that he cannot adequately express himself or, if strained, that he cannot speak. The removal of this fear is the central task of treatment. Whatever its origin, the actual abnormality in speech continues as the induced result of these factors.

It is needless to enlarge on the obvious inability of the stammerer to do himself justice in the school room. He dreads oral work, cannot contribute to discussions, and becomes a more or less silent member of the class. His intelligence is likely to be underrated; he is liable to further misjudgment. A fear complex, born of recurring failure, is the characteristic problem of mature stammering. In the case of immature stammering the conditions of adjustment are simplified, and the inhibitory tendencies more readily approachable. Relaxation and ease are the essential conditions of relief. There are principles of rhythmic speaking. Treatment should be begun when the stammering child is unaware of his peculiarity.

TRAUMA IN RELATION TO FUNCTIONAL NERVOUS DISORDERS

The extreme difficulty and the economic importance of making a correct diagnosis in cases of post-traumatic neuroses was discussed at a combined meeting of the sections of medicine, surgery, orthopedics, neurology and psychiatry.

Sir Henry Newland, describing the manner in which functional nervous disorders might follow injury, said that in the war a much larger proportion of the "walking wounded" than of stretcher patients developed such troubles. That was because the slightly injured men received less skilled attention and less "suggestive encouragement," and drifted toward despondency and neurotic conditions. Had this been recognized at the time, thousands of men would have rejoined their units much earlier than they did. Emphasizing the important part played by the imagination, Sir Henry reminded his audience of the curate who was to take part in a play and cry "My God, I'm shot" when a blank cartridge was fired. A practical joker put a strawberry in the pistol, and when the curate saw the red stain he cried "My God, I am shot" and collapsed. It was extremely difficult to trace and treat the development of a nervous disorder following injury and to say when and where malingering occurred. American companies which insured against accident now regularly employed neurologists to help in diagnosis and prognosis.

Dr. H. S. Stacy said that the difficulty in deciding between organic and functional conditions was complicated by those

cases in which organic weakness, the presence of which might not have been known, was brought to light by the developments which followed the injury.

Dr. H. F. Maudsley laid stress on the importance of securing an early diagnosis in cases in which industrial law was involved. He gave the result of his investigation of thirty-eight cases of injury to the head. Among nine cases of fracture, in which the patients averaged six weeks each in the hospital, there developed three cases of nervous instability. From seventeen cases of concussion without fracture (average time in hospital ten days), ten cases of chronic nervousness developed. Fifteen cases of injury, without fracture or concussion (average two days in hospital), produced eight such cases. It was suggested that the large proportion of chronic cases was not unconnected with compensation legislation, which was a most complicating factor. There was no doubt that the continued payment of compensation engendered a "fear" reaction, he said. It was in cases of injuries received during industrial occupation that functional neuroses were generally seen.

Dr. W. M. Macdonald was of opinion that functional neuroses could not be caused directly by trauma or by emotion. He said that during the war the French established "centers of neurology" not far behind the front line, and there treated men who had developed neuroses. As a result, they had the striking result that practically no men suffering from neurosis per se came to the base hospitals. Functional nervous disorder is not a direct result of injury; there must be something superadded—something that will reach the patient when he is in a condition of suggestibility. Insurance companies would be wise, and would save money, if they would submit all such cases to neurologists and neurologic examination.

Dr. S. V. Sewell explained how injuries to the cerebral tissue, even after the lapse of considerable time, might cause swelling within the cranium, from which arose symptoms which were too often accepted as functional. A great many cases of neurosis following injury were instances of "anxiety neurosis," the result of suggestion and autosuggestion.

Dr. S. J. Minogue submitted remarkable figures relating to cases of nervous disorder, following injuries which were the subject of compensation claims. In twenty-three such cases there were only four complete recoveries, recovery being rapid after the compensation claims had been settled for a lump sum. In seventeen cases in which no claim for compensation was involved, there were twelve complete recoveries. There was a distinct tendency among unskilled workers of low intelligence to regard such "illnesses"—following events which were the subject of claims for compensation—as a haven of refuge, and in spite of remedial measures these patients clung tenaciously to their symptoms. One of the most trying things in the practice of psychiatry was to have to listen to these patients' practiced recital of their symptoms. Our humanitarian laws have capitalized the infirmities of the neurotic.

MENTAL HYGIENE

Dr. Ralph Noble of Sydney read a paper before the section of neurology and psychiatry on "The Mental Hygiene Movement and Its Possibilities in Australia." Mental hygiene, he said, was that body of knowledge which dealt with factors that modify the resistance of the individual to the stresses of life. It was an effort to conserve and improve the minds of the people in order to secure minds so endowed and nurtured that the people would live better, act better, and think better. There were three main objects: protection of the mental health of the general public; the study of mental disorders and their causes, treatment and prevention, and the amelioration of mental disorders or deficiencies. Mental hygiene called in the aid of other sciences, such as psychology and sociology.

The mental hygiene movement commenced recently in New South Wales and New Zealand, and it was hoped by cooperation with other organizations and government departments connected with social welfare to extend the movement over Australasia and found an organization to aim at promoting the following objects:

1. The education of the general public concerning mental health and the building up of an enlightened attitude toward mental disorders, so that the stigma which is so frequently attached to mental illness may be removed, and medical advice be sought in the earliest stages.

2. To further the best methods of care and after-care of mental disorders.

3. To further the establishment of psychiatric clinics attached to general hospitals.

4. To promote the study and treatment of nervous manifestations in childhood, with the object of preventing more severe developments in later years, and the instruction of parents and others in the handling of difficult and "problem" children.

5. To obtain adequate provision for the care and treatment of the congenitally defective.

6. To investigate the problems of social maladjustments, such as dependency and criminality, in relation to congenital and acquired mental disorders.

7. The organization of social service in the community.

8. The coordination of all the resources of the community which have a bearing on mental hygiene.

Every psychiatrist knew that the mental symptoms of today were usually the result of faulty adaptation in the past—not yesterday, but years previously. At the ages of the greatest receptivity, harsh, too indulgent, ignorant or selfish parents molded the child's mind into faulty grooves. Later the structure collapsed, and mental invalidism resulted.

There was a tendency on the part of some parents to allow satisfaction to come to the child through uncontrolled imaginings which did not lead into any kind of concrete activity. The kindergarten opened an obvious approach to the problems of childhood. There was a great need for facilities for the residential treatment of difficult children, more particularly those showing emotional imbalance. Even university students required investigation, and every college should have a consultant psychiatrist on its staff. The psychiatrist could be of the greatest value also in investigating faulty methods of working in industry, as this resulted in much mental invalidism. Early treatment of nervous disorders was most desirable, and a mental hygiene movement could draw attention to the necessity for early action.

Sterilization would seem to be the most economical method of dealing with the problem of mental defects, and it is one which must eventually be faced. The children's court was another most important field for activity. The modern idea was to place a psychiatrist and a social worker at the disposal of the magistrate. This had proved most successful, especially in America. A successful mental hygiene movement must have trained and inspired leadership if adequate work was to be done. Eventually its use would be universal, and succeeding generations would marvel at the spirit of "muddle through" in which the earlier decades of the twentieth century conducted most of their sociological relationships.

Dr. Maudsley emphasized the importance of getting patients with psychoneuroses early, and spoke of the necessity for school psychologists. The work should be in the hands of the medical profession. All discharged patients from mental hospitals should be kept under observation by the mental hygiene department. Social workers who would visit the homes of such people and advise them as to the conditions of their home life would also be of service.

The proposed mental hygiene organization received the approval of those taking part in the discussion, although no formal resolution was adopted.

Marriages

STEPHEN F. GERDE, Roosevelt, N. Y., to Miss Solveig Frederiksen of Horten, Norway, at New York, October 15.

THOMAS ADDISON BAIRD, Rockford, Ill., to Miss Edna Allred Records of San Antonio, Texas, in September.

WILLIAM LISTER ROGERS, San Francisco, to Miss Dorothy Hager of Vancouver, Wash., October 4.

NELSON A. WRIGHT, JR., Pekin, Ill., to Miss Melba R. Blank of Peoria, at Springfield, October 5.

ISAAC C. WALKER to Miss Lois Metsinger, both of Marion, Ill., in Chicago, August 14.

THOMAS E. ROBERTS, Oak Park, Ill., to Miss Mabel M. Osgood, October 26.

Deaths

Orville William McKellar ⊕ Chicago; State University of Iowa College of Medicine, Iowa City, 1887; Jenner Medical College, Chicago, 1904; formerly on the staffs of the Jackson Park, Mary Thompson, Washington Park and the Cook County hospitals; aged 65; died, October 2, in a hospital at Kingsville, Texas, of myocarditis, diabetes mellitus and chronic nephritis.

Ben C. Brooke ⊕ Helena, Mont.; Bellevue Hospital Medical College, New York, 1896; member of the American College of Surgeons; formerly city physician, county physician and coroner; on the staffs of St. John's and St. Peter's hospitals; aged 57; died, September 21, of cerebral thrombosis and hypostatic pneumonia.

Frank Woodruff Chapin, New York; Bellevue Hospital Medical College, New York, 1879; medical director of the Home Life Insurance Company; formerly member of the city health department; on the staffs of the Riverside and Presbyterian hospitals; aged 75; died, October 9, of heart disease.

Richard Baxter Norment ⊕ Baltimore; University of Maryland School of Medicine, Baltimore, 1880; member of the Medical and Chirurgical Faculty of Maryland; aged 71; died, August 23, of pleurisy with effusion probably due to metastatic carcinoma of the prostate.

Colbert Newton Peak, Farmersville, Texas; Missouri College of Medicine and Science, St. Louis, 1924; served during the World War; aged 36; died, September 21, at the home of his sister in Greenville, of a malignant growth in the left kidney with metastasis to the left lung.

Bedford Forrest Coop, Houston, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1888; Beaumont Hospital Medical College, St. Louis, 1892; member of the State Medical Association of Texas; aged 64; died, September 11, of acute nephritis and uremia.

Daniel James Donohue, Butte, Mont.; Medical Department of Hamline University, Minneapolis, 1899; member of the Medical Association of Montana; veteran of the Spanish-American War; aged 55; died, October 2, of concussion of the brain as the result of a fall.

Edmund A. Wolf ⊕ Dennison, Ohio; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1892; formerly mayor of Dennison; member of the council and school board; on the staff of the Twin City Hospital; aged 59; died suddenly, October 14, of heart disease.

Oscar Dwight Clark, Powersville, Mo.; Jefferson Medical College of Philadelphia, 1923; member of the Missouri State Medical Association; for three years chief surgeon to the South American Development Hospital, Ecuador, S. A.; aged 32; died, August 31, of sarcoma.

Noah S. Wadhams, West Hampton Beach, N. Y.; Yale University School of Medicine, New Haven, 1900; member of the Medical Society of the State of New York; aged 54; died, October 4, following a local anesthetic, administered preparatory to a tonsillectomy.

William Schoenneshofer ⊕ Streator, Ill.; Rush Medical College, Chicago, 1888; served during the World War; member of the board of the La Salle County Tuberculosis Sanitarium; aged 62; died, September 28, of myocarditis, nephritis and arteriosclerosis.

John Jay Gardner, Montreal, Que., Canada; McGill University Faculty of Medicine, Montreal, 1883; formerly lecturer in ophthalmology at his alma mater; aged 72; for many years on the staff of the Montreal General Hospital, where he died, August 31.

Selwyn P. Rice ⊕ Marlin, Texas; Louisville (Ky.) Medical College, 1876; past president of the State Medical Association of Texas; on the staff of the Buie-Allen Hospital; aged 74; died, September 22, of perivesical cellulitis and septicemia.

David Hitt Williams ⊕ Knoxville, Tenn.; Bellevue Hospital Medical College, New York, 1888; aged 66; died, October 1, at the Riverside-Fort Sanders Hospital, of pulmonary edema, following an operation for incisional hernia.

Talcott Ostrom Vanamee, Portland, Maine; Columbia University College of Physicians and Surgeons, 1904; member of the Maine Medical Association; served during the World War; aged 49; died, October 7, of heart disease.

William Hodgines Atterbury ⊕ Litchfield, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1895; served during the World War; aged 59; died, September 16, of heart disease and bronchopneumonia.

Chester A. Norconk, Bear Lake, Mich.; University of Michigan Medical School, Ann Arbor, 1885; member of the Michigan State Medical Society; aged 73; died, September 23, of heart disease, while attending a patient.

Robert George Brett, Banff, Alta., Canada; Victoria University Medical Department, Coburg, Ont., 1874; formerly lieutenant governor of Alberta; proprietor of a hospital bearing his name; aged 77; died, September 16.

John Charles Edward Hagen ⊕ Alhambra, Calif.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1906; aged 56; on the staff of the Alhambra Hospital, where he died, August 10, of intestinal obstruction.

Charles Zenas Wiley, Tulsa, Okla.; Columbia Medical College, Kansas City, 1900; member of the Oklahoma State Medical Association; aged 62; died, September 21, at St. Johns Hospital, of chronic myocarditis.

Daniel M. Smith ⊕ Kansas City, Kan. (licensed, Kansas, 1901); on the staff of the Bethany Hospital; aged 70; died, October 9, at the Providence Hospital, of nephritis, uremia and dilatation of the heart.

Herbert McKinley Herrold, Kansas City, Mo.; College of Physicians and Surgeons, Medical Department Kansas City University, Kansas City, 1897; aged 69; died, October 10, of valvular heart disease.

Peter Herman Keeler ⊕ Brooklyn; Albany (N. Y.) Medical College, 1897; on the staff of the Lutheran Hospital; aged 58; died, September 30, of cerebral arteriosclerosis and chronic myocarditis.

John N. Weddell, De Beque, Colo.; Western Pennsylvania Medical College, Pittsburgh, 1887; member of the Colorado State Medical Society; aged 70; died, July 22, at Rifle, of angina pectoris.

Harry R. Irish ⊕ Forest City, Iowa; State University of Iowa College of Medicine, Iowa City, 1883; part owner of a hospital bearing his name; aged 68; died suddenly, recently, of heart disease.

Sidney J. Hall, Constantine, Ky.; Hospital College of Medicine, Louisville, 1903; member of the Kentucky State Medical Association; aged 62; died, September 16, of acute gastritis.

Charles H. Cline, Hackettstown, N. J.; Jefferson Medical College of Philadelphia, 1880; member of the Medical Society of New Jersey; aged 70; died, August 24, at the Easton (Pa.) Hospital.

Ralph Wesley Hoffman, San Francisco; University of Illinois College of Medicine, Chicago, 1922; ship surgeon; aged 36; died, September 8, while at sea on the S. S. *City of Panama.*

Calvin Lawrence Null, Princeton, Ind.; Medical College of Indiana, Indianapolis, 1891; member of the Indiana State Medical Association; aged 73; died, September 23, of heart disease.

Pompey Long Hawkins, Atlantic City, N. J.; Leonard Medical School, Raleigh, N. C., 1903; member of the board of education; aged 49; died, September 15, of pulmonary tuberculosis.

Peter Matthews Smith ⊕ Boston; Georgetown University School of Medicine, Washington, D. C., 1894; aged 60; died in October, at the Peter Bent Brigham Hospital, of ulcerative colitis.

Henry Harrison Irelan, Fairfield, Iowa; Keokuk Medical College, College of Physicians and Surgeons, 1904; aged 59;

was found dead in his office, September 30, of cerebral hemorrhage.

Lancaster George Washington ⊕ St. Louis; St. Louis University School of Medicine, 1911; served during the World War; aged 40; died, September 15, of acute dilatation of the heart.

Mitchell Langworthy ⊕ Spokane, Wash.; State University of Iowa College of Medicine, Iowa City, 1916; aged 38; died, October 8, of bullet wounds inflicted by a patient the previous day.

Franklin Kendall Dabney, Los Angeles; Homeopathic Medical College of Missouri, St. Louis, 1879; aged 76; died, July 10, at Santa Monica, of angina pectoris and arteriosclerosis.

Morton James Compton, Evansville, Ind.; Medical College of Evansville, 1883; aged 70; died, October 9, at the Protestant Deaconess Hospital, of nephritis and angina pectoris.

William James Phillips, Beaumont, Kan.; State University of Iowa College of Medicine, Iowa City, 1885; aged 72; died in September, at the Wesley Hospital, Wichita, of carcinoma.

Jason Otis Hickman, Little Rock, Ark.; Meharry Medical College, Nashville, Tenn., 1904; aged 49; died, October 2, at the Mosaic Hospital, of septicemia, following an abrasion.

Victor Carlyle Wagner, New Castle, Pa.; Jefferson Medical College of Philadelphia, 1905; aged 47; died, August 24, at St. Francis Hospital, Pittsburgh, of acute encephalitis.

Alfred Ernest Gardiner, McAdam Junction, N. B., Canada; McGill University Faculty of Medicine, Montreal, Que., 1908; served during the World War; aged 45; died, August 21.

Henry Ferdinand Fleckenstein, Jr. ⊕ Portland, Ore.; University of Oregon Medical School, Portland, 1897; aged 58; died, September 16, of thrombosis of the coronary artery.

Anna Elizabeth Barker, Woodfords, Maine; Woman's Medical College of Pennsylvania, Philadelphia, 1891; aged 68; died, September 24, in Portland, of lobar pneumonia.

Malchiah Maxwell Lucas, Washington, D. C.; Howard University School of Medicine, Washington, 1905; aged 51; died, October 4, of myocarditis and chronic nephritis.

Arthur Chester Wolfe ⊕ Ridley Park, Pa.; Medico-Chirurgical College of Philadelphia, 1903; aged 51; died, September 15, at the Taylor Hospital, of cholecystitis.

Walter S. Adams, Louisville, Ky.; Meharry Medical College, Nashville, Tenn., 1903; aged 51; died, September 28, at the City Hospital, of a self-inflicted bullet wound.

Edward A. Russell ⊕ Fitzgerald, Ga.; Atlanta College of Physicians and Surgeons, 1906; on the staff of the Fitzgerald Hospital; aged 57; died in October, of typhoid.

Henry Jesse Seeman, Rockham, S. D.; University of the South Medical Department, Sewanee, Tenn., 1900; aged 65; died, September 6, of carcinoma of the intestine.

Samuel Stanhope Stryker, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1866; aged 86; died, October 25, at the Presbyterian Hospital.

Spencer R. Stone, Atlanta, Ga.; Hahnemann Medical College and Hospital, Chicago, 1891; aged 61; died, October 3, of cerebral hemorrhage and arteriosclerosis.

Carol Tefft Stevens, New Rochelle, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1904; aged 57; died, October 3, of angina pectoris.

John Duncan Taylor ⊕ Grand Forks, N. D.; Rush Medical College, Chicago, 1893; formerly mayor, health officer and state senator; aged 70; died in September.

Fitzgerald Uniacke Anderson, Halifax, N. S., Canada; L.R.C.P., L.R.C.S., Edinburgh, 1883; M.R.C.S., England, 1884; aged 72; died, April 14, of tumor of the brain.

Henry William Farrell, Malden, Mass.; Jefferson Medical College of Philadelphia, 1889; aged 68; died in October, at the Malden Hospital, of diabetic gangrene.

Henry Francis Alexander, Knoxville, Tenn.; University of Louisville (Ky.) School of Medicine, 1893; aged 55; died, October 5, of cerebral hemorrhage.

Frank Gusman ⊕ Brooklyn; Long Island College Hospital, Brooklyn, 1917; on the staff of the Unity Hospital; aged 39; died, September 22, of heart disease.

Joseph Jerome Hardy ⊕ Poteau, Okla.; Louisville (Ky.) Medical College, 1896; aged 68; died, October 5, of cerebral hemorrhage and arteriosclerosis.

George Metzar Hunt, Chattanooga, Tenn.; Atlanta (Ga.) Medical College, 1888; aged 73; died, October 2, of arteriosclerosis and chronic bronchitis.

James Mortimer Bessey ⊕ Toledo, Ohio; Howard University School of Medicine, Washington, 1883; aged 66; died, September 27, of heart disease.

Virginius Wilton Gayle, Kansas City, Mo.; University of Maryland School of Medicine, Baltimore, 1873; aged 76; died, August 30, at Lynchburg, Va.

Sheddie Usher ⊕ Savannah, Ga.; University of Georgia Medical Department, Augusta, 1909; aged 51; died, September 2, of cerebral hemorrhage.

William Luther Martin ⊕ Chilhowee, Mo.; Marion-Sims-Beaumont Medical College, St. Louis, 1902; aged 53; died, October 1, of angina pectoris.

William Franklin Burns, Newburg, Mo.; St. Louis College of Physicians and Surgeons, 1892; aged 67; died, September 17, of carcinoma of the stomach.

Howard M. Casebeer, San Diego, Calif.; University of Michigan Medical School, Ann Arbor, 1876; aged 75; died, October 2, of heart disease.

Edward G. Magruder, San Angelo, Texas; University of Louisville (Ky.) School of Medicine, 1880; aged 72; died, October 5, of tuberculosis.

Salathiel E. Hurley, Gettysburg, S. D.; College of Physicians and Surgeons, Keokuk, Iowa, 1892; aged 80; died in August, of cholecystitis.

John Isaac Self, Mount Holly, Ark.; Atlanta (Ga.) College of Physicians and Surgeons, 1913; aged 57; died, July 27, of cerebral hemorrhage.

Basil C. McDavitt, La Plata, Mo. (licensed, Missouri, 1883); Civil War veteran; aged 86; died suddenly, September 21, of heart disease.

Louis M. Rowe ⊕ Indianapolis; Medical Department Butler University, Indianapolis, 1882; aged 68; died, October 1, of cerebral hemorrhage.

John Sloan Miller ⊕ Clymer, Pa.; College of Physicians and Surgeons, Baltimore, 1890; aged 66; died, July 14, of carcinoma of the larynx.

Thomas J. Hurst, Johnston City, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1884; aged 77; died in September, at St. Louis.

Edgar S. Johnston, Gibsonburg, Ohio; University of Michigan Medical School, Ann Arbor, 1879; aged 86; died, October 11, of senility.

George Lewis Watson ⊕ Cherokee, Iowa; Keokuk Medical College, 1897; aged 70; died, September 16, of skull fracture received in a fall.

Adam D. Ellis, Mercer, Mo.; College of Physicians and Surgeons, St. Louis, 1900; aged 51; died, September 25, of chronic nephritis.

Jacob Eastman Miller ⊕ Rogersville, Tenn.; University of Louisville (Ky.) School of Medicine, 1890; aged 71; died, September 30.

Peter Douglas Van Kleeck, Armstrong, B. C., Canada; Trinity Medical College, Toronto, 1899; died, July 28, at Rochester, Minn.

Albert Edward Collyer, Redondo Beach, Calif.; Hering Medical College, Chicago, 1904; aged 58; died, March 16, of myocarditis.

Olin E. Holloway, Knightstown, Ind.; Medical Department of Butler University, Indianapolis, 1881; aged 73; died, September 25.

Byron Field, Pickering, Ont., Canada; University of Toronto Faculty of Medicine, Toronto, 1877; aged 77; died, August 6.

David Curtis Rodes, Sandstone, W. Va.; Hospital College of Medicine, Louisville, 1896; aged 70; died, August 31, of paralysis.

Donat Handfield, Montreal, Que., Canada; Montreal School of Medicine and Surgery, 1907; aged 43; died suddenly, September 9.

John W. Connellan ⊕ Portland, Maine; Medical School of Maine, Portland, 1892; aged 61; died, October 1, of pneumonia.

William Douglas, Fort Erie, Ont., Canada; University of Toronto Faculty of Medicine, 1867; aged 93; died, August 30.

John Breckenridge Gordon, Harms, Tenn.; St. Louis Medical College, 1877; aged 71; died, July 22, of ileocolitis.

William Henry Hickey, Leipsic, Ohio; Cleveland Medical College, 1870; aged 82; died, September 28, of myocarditis.

William Fox, Mohawk, Tenn.; Chattanooga Medical College, 1892; aged 66; died, October 5, of pneumonia.

N. E. Tullos, Mize, Miss. (licensed, Mississippi, 1905); aged 56; died, September 10, of heart disease.

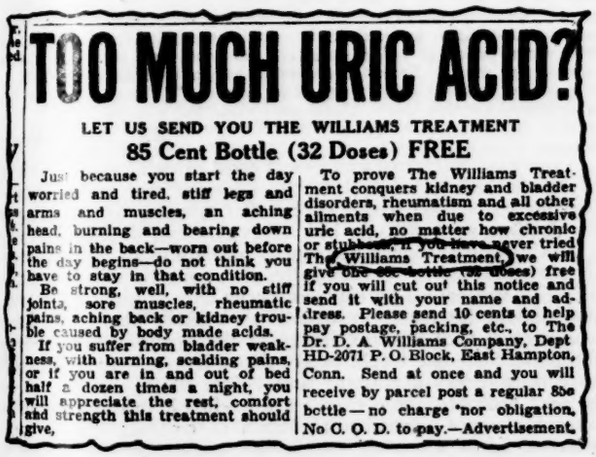
Bureau of Investigation

THE D. A. WILLIAMS QUACKERY

The National Better Business Bureau Issues a Report

The National Better Business Bureau, with headquarters in New York, and the various affiliated Better Business Bureaus scattered over the country have for some time been doing excellent educational work in giving editors and publishers the facts regarding schemes that are operated to the detriment of the public. Naturally, the medical field comes in for its share. Physicians may be interested in knowing that not a day passes but the Bureau of Investigation of the American Medical Association receives requests either from the National Better Business Bureau or from some of the affiliated Better Business Bureaus asking for information on certain medical schemes that seem open to suspicion. More than six hundred such letters have been received and answered so far this year.

The Better Business Bureaus are primarily interested in "Truth in Advertising." Knowing that every false, misleading or fraudulent advertisement in any field tends eventually to break down public confidence in all advertising, the Better Business Bureaus—which are an outgrowth of the International Advertising Association, previously known as the Associated Advertising Clubs of the World—have been, and are, carrying on a campaign for truthful advertising that redounds not only



TOO MUCH URIC ACID?

LET US SEND YOU THE WILLIAMS TREATMENT

85 Cent Bottle (32 Doses) FREE

Just because you start the day worried and tired, stiff legs and arms and muscles, an aching head, burning and bearing down pains in the back—worn out before the day begins—do not think you have to stay in that condition.

Be strong, well, with no stiff joints, sore muscles, rheumatic pains, aching back or kidney trouble caused by body made acids.

If you suffer from bladder weakness, with burning, scalding pains, or if you are in and out of bed half a dozen times a night, you will appreciate the rest, comfort and strength this treatment should give.

To prove The Williams Treatment conquers kidney and bladder disorders, rheumatism and all other ailments when due to excessive uric acid, no matter how chronic or stubborn, if you have never tried The Williams Treatment, we will give one 85c bottle (32 doses) free if you will cut out this notice and send it with your name and address. Please send 10 cents to help pay postage, packing, etc., to The Dr. D. A. Williams Company, Dept HD-2071 P. O. Block, East Hampton, Conn. Send at once and you will receive by parcel post a regular 85c bottle—no charge nor obligation. No C. O. D. to pay.—Advertisement.

to the credit of advertising in general but, in the medical field at least, also operates in the interest of public health.

In doing this work the National Better Business Bureau issues bulletins which are sent to periodical publishers. These bulletins contain the facts that have been collected from whatever sources are available. A recent bulletin—No. 192, issued October 17, 1929—deals with the Dr. D. A. Williams Company of East Hampton, Connecticut. This concern has been operating a piece of mail-order quackery for many years. The Bureau of Investigation of the American Medical Association published an article on it more than ten years ago in THE JOURNAL of May 31, 1919, in which the history of the concern was given.

It was brought out that so extensive had the business become that it had given the little village of East Hampton, with a population of less than 1,500 people, a postoffice of the second class! At the time of THE JOURNAL'S article, form-letters sent out by the D. A. Williams concern were signed, variously, "Theodore Flaacks, President," "J. M. Stearns, Manager," and, occasionally, "Dr. E. E. Williams, Medical Advisor." It was also shown that the Dr. D. A. Williams concern had made a practice of selling to letter-brokers the original letters that had been sent to it by prospective victims. It was shown, too, that the preparation sent out by the company for the alleged cure of all "uric acid troubles" was essentially a solution of potassium acetate, colored and flavored with wintergreen. Examination of a specimen sent out by the D. A. Williams concern in October, 1929, indicates that the composition of the nostrum has not changed. Now comes the report of the National Better Business Bureau, which is so interesting that it is quoted in full. Says the bulletin:

"This company has advertised that it will send to those making inquiry a trial bottle of the Williams treatment to 'prove' that it 'conquers kidney and bladder disorders, rheumatism and all other ailments when due to excessive uric acid, no matter how chronic or stubborn . . .'

"Individuals who ask for the free treatment have received a booklet entitled, 'Feeling Twenty Years Younger,' which extolls the merits of the Williams Treatment, and a symptomatic report blank or questionnaire, which they are asked to fill out and return to the company's medical adviser, who, it is alleged, will advise treatment in accordance with the data furnished in the blank.

"On June 1, 1929, C. V. Flaacke, proprietor of the Dr. D. A. Williams Company, stated to this Bureau that the company aims to treat different types of uric acid conditions. According to Flaacke, Dr. Wilson Powell of New Haven, Conn., is retained to examine the report blanks and recommend treatment on the basis of the data contained therein. In substantiation of this operating premise, ten different form letters, advising distinct treatments according to the type of uric acid condition from which the respondent suffers, as determined by Dr. Powell, were submitted to the Bureau.

"Flaacke claimed that the company will not sell its treatment to anybody who shows by his answer to the questionnaire that he will not benefit by it. A form-letter advising consultation with a physician, which Flaacke stated was sent to those whose serious condition indicated the need for supervised local treatment, was included in the form replies submitted to the Bureau.

"With the assistance of the Medical Information Bureau of the New York Academy of Medicine, four report blanks were filled out and sent to the Williams Company from different parts of the country to determine whether the company declined to sell its product to those who were suffering from serious ailments. Due to the fact that diagnosis by mail is declared to be unscientific and untrustworthy by medical authorities, pronounced symptoms were indicated. In the following digests, the conditions indicated in the blanks are underlined, followed by the diagnosis and prescription which were returned under the signature of Dr. Powell:

"CASE 1.—*Serious condition of tuberculosis.* Powell advised that the respondent was suffering from rheumatism and recommended the Williams Treatment and a 'special medicine.'

"CASE 2:—*Cancer of the stomach.* Powell's diagnosis was excess uric acid. Advised Williams Treatment and a 'special formula No. 707.'

"CASE 3:—*Good health except for a slight neurasthenic condition.* Powell asked for further report since condition appeared to require little medication. Nevertheless, urged use of two bottles of Williams Treatment.

"CASE 4:—*Heart disease in an advanced stage.* Diagnosis and recommendation for treatment was same as in Case 1. Case 4 then wrote the Williams Company stating that a physician had told him that he was suffering from a 'leaking heart.' The company replied that the physician was in the best position to judge, but 'your cardiac condition does not exclude the possibility of a hyperacid condition present.'

"The following statement appears in the letters addressed to Cases 1 and 4:

"'In my opinion, your case is not as bad as many I have known of . . . If your written statement did not clearly indicate the cause, I would not be willing to take your case under consideration for treatment, as our work here is limited to only such conditions as are caused by an excess of uric acid and other body-made poisons.'"

Physicians will be interested in knowing that Dr. Wilson Powell of New Haven, Connecticut, was born in 1895 in Newfoundland and was graduated in medicine by Queen's University Faculty of Medicine, Kingston, Ontario, in 1924. He was licensed to practice in Oregon in 1924 and in Connecticut in 1925. He is a member of his local medical society and, through that, has qualified as a Fellow of the American Medical Association.

Epilepsy.—It is doubtful if any distinction exists between symptomatic and so-called idiopathic epilepsy. Etiologic factors are numerous. The most important factors may be classified as organic disease of the brain, intoxications and circulatory disorders. . . . The most important phase of treatment is the diagnosis of the underlying condition. The examination of every epileptic should be an exhaustive one. The neurological examination should be repeated at intervals, as the convulsions may be the sole evidence of brain disease for some time before other signs or symptoms appear.—Smith, W. A.: The Epilepsies.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

USES AND METHODS OF DOUCHING

To the Editor:—What type of vaginal douche apparatus is most suitable under the various conditions in which it is desirable to use a douche? In what position of the patient can the douche be used to the best advantage? What quantity of solution should be used? Can it be done as satisfactorily by the patient herself as by an attendant? Please omit name.

M.D., Ohio.

ANSWER.—For nearly all purposes a vaginal douche apparatus which permits a flow of liquid according to the laws of gravity is better than one in which other forces, such as compression of a bulb, are necessary. The two most common douche containers are a rubber bag and a metal can with or without a glazed covering. The can is preferable because it can more readily be cleaned and sterilized. The rubber tubing connected with the can or bag should be between 4 and 5 feet long. At the end of the tube which enters the vagina there should be a hard rubber or glass nozzle. The former is safer to use because the glass one may break and cause harm.

When a woman takes a douche she should lie on her back or have her shoulders only slightly elevated. The bath tub is a more convenient place for a vaginal douche than a bed. If the douche is taken while a patient is in bed, a bed pan must of course be placed under the patient's hips. The douche can or bag should be elevated about 2 or 2½ feet above the level of the vagina and it should be kept there by an assistant or suspended from a hook or bed post. If the can is raised much higher than this there may be too much force, and if it is much lower there will not be sufficient force.

Vaginal douches are usually prescribed to remove excessive or abnormal vaginal discharges due to vaginitis, cervicitis, the wearing of a pessary, or similar conditions, and to give relief from pain and tenderness due to pelvic inflammatory conditions. Douches are also employed after coitus for cleanliness and to prevent conception; for the latter purpose they are not always successful. Generally speaking, it does not matter what substances are placed in the water used for a douche. The good results are due to the mechanical removal of the abnormal discharge or to the heat and moisture of the douche in cases of pelvic inflammation. The substances most commonly used in douches are salt, borax, sodium bicarbonate, compound solution of cresol, potassium permanganate, mercuric chloride, iodine and alum. In most cases the temperature of the douche water should be as hot as the patient can comfortably bear. This is usually between 105 and 115 F. For cases of vaginal discharge, 1 or 2 quart douches once a day usually suffice. In cases of pelvic inflammation, however, prolonged douches of 8 or 10 quarts (liters) of water are necessary to produce satisfactory results. At least fifteen or twenty minutes should be spent taking the latter kind of a douche. A woman can readily give herself a douche but it is much more convenient and satisfactory to have some one else give it, especially when the douche can or bag must be refilled a number of times. A simple way in which a woman can give herself a prolonged hot douche is to eliminate the use of a can or a bag and to attach the rubber tube directly to the faucet in a bath tub. After regulating the flow as to the proper temperature and force, the woman can relax comfortably and take as long a douche as she likes.

THERAPEUTIC VALUE OF RAYS FROM TUNGSTEN FILAMENT

To the Editor:—The following statement recently appeared in an article on "Light Therapy" in one of our Canadian journals: "The tungsten-filament lamp known as the blue daylight bulb is rich in visible and near infra-red fields." If this is true, would it not be possible to use these lamps in place of the much more expensive mercury vapor and carbon arc lamps and still obtain the desired therapeutic results? How many of these blue daylight bulbs would have to be used, and at what distance and voltage, in order to generate a sufficient quantity of the rays to be of clinical value?

J. W. WINTER, M.D., Montreal.

ANSWER.—The ordinary Mazda tungsten filament lamp was designed for the purpose of generating visible light. It is not an efficient source of therapeutic ultraviolet. The small amount of ultraviolet energy that is emitted by the filament is strongly absorbed by the enclosing glass bulb. However, bulbs have been made of special glass that transmits wavelengths extending from 280 to 310 millimicrons, which radiant energy is recognized as effective in preventing and curing rickets. But even when the tungsten filament is enclosed in such a bulb, it is questionable whether enough radiation in the zone from 280 to 310 millimicrons is emitted to have any great therapeutic effect.

The gas-filled tungsten lamp is useful as a source of visible and short wavelength infra-red radiation, of wavelengths less than 1,500 millimicrons. About 30 per cent of the total radiation emitted by the gas-filled tungsten lamp is of wavelengths that can penetrate deeply into the skin. Visible and infra-red rays on absorption are transformed probably entirely into heat. Therefore a lamp of this nature is useful in those conditions in which heat is indicated.

POSSIBLE MALINGERING

To the Editor:—A patient presented herself to me with a brownish stain over both hands, as if the whole hand had been dipped in iodine and allowed to dry. There are no other symptoms except this stain, which is evenly distributed over the fingers and the hands, including the wrists. It comes on gradually, reaches its height and disappears in a week or ten days to reappear again in a few days or weeks. Any suggestion as to cause or treatment will be appreciated. Please omit name.

M.D., Vermont.

ANSWER.—The only possibility that comes to mind is that of deception. If the patient is put in the hospital where she cannot get any stain, the trouble will cease only, in all probability, to recur when she goes home. She needs mental treatment.

ENURESIS IN ADULT

To the Editor:—A man, aged 21, wets the bed every night and has done so all his life. I have tried several drugs, including pituitary extract hypodermically, bromides, strychnine, urinary sedatives containing atropine, and thuja, unsuccessfully. Pituitary extract relieved all symptoms for a period of two months, only to have them return as bad as ever, if not worse. Bromides seemed to help a little for a week or so. The patient does not drink water after supper. Will you suggest a line of treatment for this case? Please omit name and address.

M.D., Pennsylvania.

ANSWER.—Nocturnal enuresis is most often of psychic origin. Were the lack of control of the sphincter due to an organic nervous lesion, one would expect that enuresis would occur in the daytime as well as in bed. Nevertheless, the possibility of a defect, such as might accompany a spina bifida, for example, should be excluded. Occasionally, also, epileptic seizures, which may be accompanied by enuresis, occur only at night. Observation should be made to determine whether there are other evidences of such seizures, though if the condition has persisted throughout life one would expect that seizures, if present, would have been observed at some time before the age of 21. If, as is most probable, these causes are excluded, therapy should be directed toward education in habits of control; this is more effective when a motive can be discovered for the failure to establish control, and it is advisable to consult a competent psychiatrist.

DIAGNOSIS OF PAINS IN LEGS

To the Editor:—A man, aged 50, married, without children, whose wife has had no miscarriages, has had what he calls shifting rheumatism for ten years. About two years ago, darting pains started in the feet and legs. These were of moderate severity. These pains would last about one day, returning again from every two to eight weeks. In January, 1929, I saw the patient because of influenza; the temperature was 103; aches occurred throughout. The second day, lancinating pains started in the legs, about the knees. These pains seemed to pass down through the calf of leg, coming at intervals of about three to five minutes. They were so severe that the patient's legs would jerk as if stimulated by electricity. Morphine, one-half grain hypodermically, gave little relief. At this time the blood Wassermann reaction was negative; clinical manifestations for syphilis were negative. The severe pains continued for three days. Aqueous bismuth was given, which seemed to give some relief. The pains and muscular cramps soon disappeared. Two weeks later the spinal fluid Wassermann reaction was negative. During the past two months, he has had darting pains about the ankles, coming at intervals of about two weeks and lasting about one or two days. What do you suggest? Do not print name or address, please.

M.D., Ohio.

ANSWER.—The information given is not sufficient to justify an attempt at diagnosis. The history of the pains is of course suggestive of the lightning pains of tabes or some other spinal cord or root lesion. The Wassermann reaction of the spinal fluid is often negative in tabes unless doses larger than 0.2 cc. are used in the test. Nothing is said of other tests of the fluid—the cell count, protein and globulin tests, and colloidal gold or mastic tests. These may give positive information even when the Wassermann test is negative. The best advice that can be given is that a neurologist be consulted.

SYMPATHICOTONIA

To the Editor:—Please give me the definition of the term sympathicotonia. Also please discuss briefly the treatment of primary neurasthenia.

D. B. COOVER, M.D., Littlestown, Pa.

ANSWER.—The term sympathicotonia, introduced by Eppinger and Hess (Vagotonia: A Clinical Study in Vegetative Neurology, ed. 3, Nervous and Mental Diseases Monograph 20), was applied to a condition in which the sympathetic system appeared to dominate in the general functioning of the body organs. This was based on the fact that many organs and vegetative muscles receive a dual nerve supply, each of which causes an opposite effect. For example, the heart muscle is supplied by both the sympathetic and the vagus; the former speeds the rate of contraction and the latter slows it; the sympathetic dilates the pupil, while the third nerve (considered as part of the vagus system in this respect) contracts it. It was assumed, therefore, that there is an antagonism between the vagus and the sympathetic systems which serves to maintain a balanced equilibrium in relation to changing conditions. It was then suggested that either one of these two systems might dominate in the regulation of body activities and the different states thus produced were spoken of as sympathicotonia and vagotonia, respectively. People presenting these two types of vegetative activity showed different kinds of personality, the sympathicotonic person being alert, rosy cheeked and of vigorous emotional response; they also showed differences in reaction to various drugs, such as atropine and pilocarpine.

The term "primary neurasthenia" is altogether too vague to justify any discussion of therapy. Reference should be made to any good textbook on psychoneuroses. (Wechsler, I. S.: The Neuroses, Philadelphia, W. B. Saunders Company, 1929. Jelliffe, S. E., and White, W. A.: Diseases of the Nervous System, ed. 5, Philadelphia, Lea & Febiger, 1929.)

POLYCYTHEMIA WITH EPILEPTIFORM ATTACKS

To the Editor:—I am treating a definite case of polycythemia. A farmer, aged 61, has been sick several years. He has attacks strongly suggesting petit mal. Constipation is marked and there is loss in weight. The systolic blood pressure is 130; diastolic, 90; hemoglobin, 150; red cells, 7,660,000. There is slight enlargement of the liver and spleen. Urinalysis is negative except for a faint trace of albumin and a few red cells. Please suggest a line of treatment. Is potassium iodide indicated? If the x-rays are indicated, what is the dosage and how frequent? Please omit name.

M.D., Iowa.

ANSWER.—Epileptiform attacks have been reported in polycythemia, as well as psychic symptoms, olfactory delusions, and loss of memory. F. Parkes Weber and O. B. Bode in "Polycythemia, Erythrocytoses and Erythraemia" give an excellent summary on the subject.

Venesection, 500 cc., repeated at intervals of several weeks, may be of value. This can do no harm and is of the surest value.

Roentgen treatment should be directed at the bone marrow and should be in the hands of some one especially conversent with the technic. The spleen is not to be treated. It is the tissue that can be most relied on for hemolysis, and should not be interfered with.

Benzene has been used with some success but should be used cautiously, and the blood count should be watched. It must be borne in mind that its action may persist for a variable period after its discontinuance.

Spleen by mouth and splenic extracts, which would appear theoretically to be indicated, have not been of value. A diet tending to stimulate blood formation should be avoided.

POSSIBLE DIAGNOSIS OF GOUT

To the Editor:—A white man, aged 52, a machinist, who had scurvy thirty-two years ago, malaria twenty years ago, and a violent reaction after typhoid vaccination ten years ago, for the past two summers has had seven attacks of swelling and pain in the right foot, which becomes erythematous. This is accompanied by a chill and rise in temperature to 103 F. Pain and swelling last from two days to two weeks. The condition occurs only in the summer, but the foot feels cold in the winter. Physical examination is negative, except for the foot during an attack. What is the probable diagnosis? What treatment? Please omit name.

M.D., Rhode Island.

ANSWER.—The most probable explanation is repeated attacks of gout. The temperature is more prominent as a symptom than usual, but such an elevation of temperature does occur, as well as chilly sensations. A therapeutic test would clear this up. Gout is by no means confined to those who are overfed or are alcoholic, and may occur in any condition of life. Infection would seem improbable.

TREATMENT OF FOUR PLUS WASSERMANN REACTION WITHOUT OTHER EVIDENCE OF SYPHILIS

To the Editor:—A boy, aged 17 years, has Hutchinson teeth and a Wassermann reaction of 4 + without other evidence of disease. Is treatment indicated? If so, what schedule? Please omit name and initials.

M.D., Ohio.

ANSWER.—There is a difference of opinion as to the course that should be followed with a case of this sort. What perhaps may be called the radical school would urge treatment with a view to trying to cure the syphilis. The result is one that cannot be hoped for with any assurance and in the effort to bring it about by vigorous treatment the patient may be physically harmed. It might be well to treat such a case symptomatically, the patient being given antisyphilitic treatment as long as it improves his general physical condition. Beyond that one should not go. Guidance should be placed on the clinical indications primarily, with less attention to the Wassermann reactions. This treatment may be carried out with arsphenamine and bismuth in the usual way or with mercury and potassium iodide in the usual way. The first is the method of election, the second is a recourse in the event the first sort of treatment proves not well tolerated.

STANDARDS OF POTENCY OF ARSPHENAMINE

To the Editor:—Will you kindly furnish information regarding the standards of potency required of the various brands of neoarsphenamine now being marketed in this country? The impression prevails among a great many men engaged in the treatment of syphilis that one brand, somewhat more extensively advertised than others, also considerably more expensive to purchase, has appreciably superior therapeutic value, and that certain other brands less expensive and less extensively advertised are inferior in therapeutic potency. It has been my impression that certain standards of therapeutic potency were required of all brands marketed and that there could be no wide variation in results obtained in similar tests of various brands or lots of the drug. If scientific tests have been reported in any recent publication dealing with this matter, I would appreciate reference to them.

J. EDWARD JOHNSON, M.D., Mineral Wells, Texas.

ANSWER.—There is no official standard for therapeutic potency of arsphenamine preparations. According to reports of the United States Public Health Service Hygienic Laboratory, no one brand has been definitely established as superior to others when considered from the point of view of clinical efficiency.

In some foreign countries, every preparation of arsphenamine and neoarsphenamine is tested on mice for therapeutic efficiency before being used. Such a procedure has not, however, as yet been adopted in this country.

MINERAL CONTENT OF DRINKING WATER

To the Editor:—I beg leave to submit the enclosed copy of the chemical analysis of water supplied to consumers of one of the municipalities of the county, and to request your opinion on the following points: 1. Would this water by reason of its mineral content cause any disease condition of any part of the urinary tract? 2. Would it predispose any one to these conditions? 3. Would its use be injurious to any one already suffering from renal disease? 4. Would its use be inadvisable from any other standpoint? I will appreciate your opinion in this matter as well as any other comment you may make.

ANALYSIS OF WATER FROM "UPTOWN WELL," CITY OF PASCAGOULA

	Grains per U. S. Gallon
Organic and volatile matter	8.939
Sodium chloride	45.492
Sodium bicarbonate	13.091
Sodium sulphate	0.347
Calcium carbonate	0.705
Magnesium carbonate	0.220
Total solids	68.794
Free carbonic acid	4.414
Incrusting solids	0.925
Nonincrusting solids	67.869

R. G. LANDER, M.D., Pascagoula, Miss.

ANSWER.—According to the analysis, this water appears to be one of moderate hardness, slightly alkaline in character and containing a fairly high amount of sodium chloride but not excessively high for many deep well waters found in the United States.

1 and 2. There is no reason to believe that this water would have any part in the causation of pathologic conditions of the urinary tract either directly or as a predisposing factor.

3. There is some difference of opinion among clinicians with regard to the effect of such a water on persons suffering from renal diseases. It is probable that this water would be undesirable for patients suffering from acute or chronic inflammatory renal disturbance, particularly when there is interference with sodium chloride excretion.

4. No.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ARKANSAS: Little Rock, Nov. 12-13, 1929. Sec. Reg. Board, Dr. Sam J. Allbright, Searcy, Ark. Sec. Eclec. Board, Dr. Claude E. Laws, 803½ Garrison Ave., Fort Smith, Ark.

CONNECTICUT: Hartford, Nov. 12-13, 1929. Sec., Dr. Robert L. Rowley, 79 Elm St., Hartford, Conn.

DELAWARE: Wilmington, Dec. 10-12, 1929. Sec., Dr. Harold Springer, 1013 Washington St., Wilmington, Del.

FLORIDA: Miami, Nov. 19-20, 1929. Sec., Dr. William M. Rowlett, 812 Citizens Bank Bldg., Tampa, Fla.

KANSAS: Topeka, Dec. 10, 1919. Sec., Dr. Albert S. Ross, Sabetha, Kan.

MAINE: Portland, Nov. 12-13, 1929. Sec., Dr. Adam P. Leighton, Jr., 192 State St., Portland, Me.

MARYLAND: Baltimore, Dec. 10-13, 1929. Sec., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore, Md.

MASSACHUSETTS: Boston, Nov. 12-14, 1929. Sec., Dr. Frank M. Vaughan, 144 State House, Boston, Mass.

MISSOURI: Kansas City, Nov. 12-14, 1929. Sec., Dr. James Stewart, Capitol Bldg., Jefferson City, Mo.

NATIONAL BOARD: Feb. 12-14, 1930. In all centers where there are five or more candidates. Dir., Mr. E. S. Elwood, 225 South Fifteenth St., Philadelphia, Pa.

NORTH CAROLINA: Durham, Nov. 27, 1929. (Endorsement of Credentials only.) Sec., Dr. J. W. MacConnell, Davidson, N. C.

OHIO: Columbus, Dec. 4-6, 1929. Sec., Dr. H. M. Platter, 85 East Gay St., Columbus, Ohio.

SOUTH CAROLINA: Columbia, Nov. 11, 1929. Sec., Dr. E. A. Boozer, 505 Saluda Ave., Columbia, S. C.

TEXAS: Dallas, Nov. 19-21, 1929. Sec., Dr. T. J. Crowe, 918-919 Mercantile Bank Bldg., Dallas, Texas.

UTAH: Salt Lake City, Dec. 17-18, 1929. Director, Mr. S. W. Golding, 412 State Capitol Bldg., Salt Lake City, Utah.

VIRGINIA: Richmond, Dec. 3, 1929. Sec., Dr. J. W. Preston, 720 Shenandoah Life Bldg., Roanoke, Va.

WEST VIRGINIA: Morgantown, Nov. 26-28, 1929. Sec., Dr. W. T. Henshaw, Public Health Council, Charleston, W. Va.

WISCONSIN: Milwaukee, Dec. 14, 1929. Basic Science. Sec., Prof. Robert N. Bauer, 3410 Wisconsin Ave., Milwaukee, Wis.

Rhode Island July and October Examinations

Mr. Lester A. Round, director of the State Public Health Commission, reports the written examinations held at Providence, July 2-3 and Oct. 3-4, 1929, and the oral examinations held July 11 and Sept. 19, 1929. The examinations covered 7 subjects and included 70 questions. An average of 80 per cent was required to pass. Thirteen candidates were examined and passed. The following colleges were represented:

PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine	(1927)	84, 80
Boston University School of Medicine	(1928)	91.1, 87
Harvard University Medical School	(1918) 80, (1926)	81
Tufts College Medical School	(1927) 82.3, (1928)	88.1
Hahnemann Med. College and Hospital of Philadelphia	(1928)	89.5
Medical College of the State of South Carolina	(1928)	89.3
University of Vermont College of Medicine	(1926)	80
University of Montreal Faculty of Medicine	(1929)	85.4
University of Rome Faculty of Medicine	(1926)*	80

* Verification of graduation in process.

Arizona July Examination

Dr. H. P. Mills, secretary of the Board of Medical Examiners of the State of Arizona, reports the written examination held at Phoenix, July 2-3, 1929. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Four candidates were examined and passed. Eight physicians were licensed through reciprocity with other states and one by endorsement of credentials. The following colleges were represented:

PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine	(1927)	87.2
University of Illinois College of Medicine	(1928)	91.8
University of Oklahoma School of Medicine	(1927)	91.5
University of West Tennessee Coll. of Med. and Surg.	(1918)	77.1

LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists	(1923)	California
Denver and Gross College of Medicine	(1903)	Oklahoma
Atlanta College of Physicians and Surgeons	(1902)	Georgia
Keokuk Medical College	(1902)	Missouri
University of Louisville School of Medicine	(1921)	Kentucky
Tulane University of Louisiana School of Medicine	(1912)	Louisiana
Baltimore Medical College	(1907)	Missouri
St. Louis University School of Medicine	(1926)	Missouri

ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement with
University of Minnesota Medical School	(1928)	U. S. Navy

Book Notices

PRACTICAL CLINICAL LABORATORY DIAGNOSIS: A Thoroughly Illustrated Laboratory Guide Including the Interpretation of Laboratory Findings, Designed for the Use of Students and Practitioners of Medicine. By Charles C. Bass, M.D., Dean and Professor of Experimental Medicine, the School of Medicine, Tulane University of Louisiana, and Foster M. Johns, M.D., Assistant Professor of Medicine and Director of the Laboratories of Clinical Medicine, the School of Medicine, Tulane University of Louisiana. Third edition. Cloth. Price, $7.50. Pp. 187, with 154 illustrations. Baltimore: Williams & Wilkins Company, 1929.

In the preparation of this work the authors have selected what they regard as the best, simplest and most practical method of making each test, the result being that only those laboratory examinations useful in ordinary, everyday practice are included. No attempt is made to discuss tests seldom used except by the special laboratory worker. The book is divided into seventeen chapters covering the use and care of the microscope; blood; differential leukocyte counts; total blood cell counts; platelet counting; hemoglobin estimation; special blood tests; blood sugar determinations, fragility tests, blood matching, bleeding time and coagulation time determinations; malaria; typhoid agglutination tests; urine; gastric contents; feces; pus, exudates and similar material; sputum; leprosy; spinal fluid; diphtheria; gonorrhea, and syphilis. There are, in addition, two appendixes, the first containing the formulas for making the various reagents mentioned in the text, while the second covers a list of the apparatus recommended for equipping the laboratory. The discussions are clear and as concise as possible. The text is illustrated by numerous excellent original cuts and colored plates, which add much to the value of the descriptive text and cannot be too highly praised. It is difficult to mention any special sections as especially noteworthy, as the entire book is arranged and presented in such a satisfactory manner that it has a uniform value. The interpretations of the different tests are adequate, although, perhaps, somewhat brief. This book is highly recommended to the student and practitioner who may wish to have a trustworthy guide in their daily work in clinical laboratory diagnosis.

DIE NEUROPATHOLOGISCHEN SYNDROME ZUGLEICH DIFFERENTIALDIAGNOSTIK DER NERVENKRANKHEITEN. Von Dr. M. Kroll, o. ö. Professor, Direktor der Nervenklinik der Weissrussischen Staatsuniversität Minsk. Paper. Price, 45 marks. Pp. 554, with 216 illustrations. Berlin: Julius Springer, 1929.

Under the headings of general syndromes such as the syndromes of reflex disturbances, of sensory changes and of motor disturbances, the author takes into consideration first the physiology and pathology of each subject. Then in considerable detail he discusses the various types of disease entities that may be considered under each syndrome. The book is liberally illustrated and adequately indexed. The author's neurologic conceptions are extremely modern and carefully considered. This is one of the most interesting of recent works on neurology and is especially useful in the study of differential diagnosis.

WHAT EVERYONE OUGHT TO KNOW: HEALTH. By Oliver T. Osborne, M.D. Cloth. Price, $2.50. Pp. 313. Springfield: Charles C. Thomas, 1929.

The maintenance of good health should be the chief concern of every one; nevertheless there is a surprising ignorance of the mechanisms of the human body, the physiologic processes dealing with growth, nutrition and health, and the hygienic rules necessary for healthy living. Too many of the books written for laymen are meant as guides for self-treatment, which is always dangerous. Others discuss the cause and symptoms of the various diseases, information which is of doubtful value excepting to the physician. This book presents in simple language and interesting style some of the facts concerning physiology, health and prevention of disease that it behooves every one to know. There are chapters on growth and development, physiology, nutrition and foods, health habits, climate, infection, disease prevention and accidents. There are well written discussions of nostrums and quackery, choosing a physician, and the child and the schools. A number of health axioms, well worth following, are included. The author seems to have rather fixed ideas on the question of the use of tobacco.

Otherwise, such material as is presented is authentic and unbiased. Much good will come from wide distribution of the book. It will help dispel many misbeliefs and superstitions, and will lead to a better understanding of ways to good health. It will aid in eliminating much charlatinism and quackery.

DIE TECHNIK UND ANWENDUNG DER SUBOCCIPITAL- ODER ZISTERNENPUNKTION. Von Dr. med. Alois M. Memmesheimer, Privatdozent und Oberarzt an der Klinik und Poliklinik für Hautkrankheiten der Universität Tübingen. Paper. Price, 8.50 marks. Pp. 80, with 37 illustrations. Stuttgart: Montana-Verlag A.-G., 1929.

The summary of the development of the method of cistern puncture in man gives less credit to the American Ayer and more to Eskuchen than is deserved. A detailed account of the topographic anatomy of the region punctured is clearly given as well as a discussion of the type of instruments and operative technic. The German method of first touching the occipital bone, then sliding down into the cisterna, and the American method of direct puncture are compared. The author faithfully discusses the dangers and pitfalls and the necessary precaution to prevent all untoward effects from the procedure. The various dangerous possibilities seem to be overrated by previous authors, as even puncturing the medulla is a matter that causes symptoms for only a few hours. No contraindication is found by Memmesheimer in increased intracranial pressure such as caused by an intracranial tumor, for the cisternal puncture supposedly removes ventricular fluid. This and several other optimistic assertions can hardly be ascribed to. Further discussion as to the pressure, constituents and pathologic variations of the fluid drawn from the cistern are given in little detail. In general, the monograph is valuable in aiding the novice to learn the method but adds hardly more than the original published articles on the subject.

RECENT ADVANCES IN NEUROLOGY. By W. Russell Brain, M.A., D.M., M.R.C.P., Assistant Physician to the London Hospital, and E. B. Strauss, B.A., B.M., B.Ch., Medical Registrar to the Hospital for Epilepsy and Paralysis, Maida Vale. Cloth. Price, $3.50. Pp. 412, with 38 illustrations. Philadelphia: P. Blakiston's Son & Company, 1929.

This volume is an attempt at summarization of the neurologic work done in the last few years under many separate headings. The space allotted to each is too meager to allow of much detail, especially since the authors include far too much time in their conception of recent. What has been written is, however, well done and clearly indicates that considerable reading has been digested and "boiled down." Much more usefulness would be afforded from a work of the sort if it were published yearly.

FOOD FOR CHILDREN AND HOW TO COOK IT, WITH AN ARTICLE ON INDUCING THEM TO EAT IT. By Marion W. Flexner, and Isabella McLennan McMeekin. Cloth. Price, $1.50. Pp. 125. New York: Henry Holt & Company, 1929.

The bugbear of the pediatrician's existence nowadays is the child who will not eat. Unfortunately, to build the proper eating habits is not a simple and easy task, and any aids that the physician may find are heartily welcomed. In most cases the cause for poor eating lies in ill health and wrong training, but many times the difficulty begins because the child has been served foods that were improperly prepared, not tasty, overseasoned, or burned. This book has been written to supplement the physician's instructions to parents, and to teach mothers to prepare food for the child palatably and correctly. The book is made up of recipes for the various articles in the diet, with several menus appended, and an introductory chapter on inducing the child to eat. Many of the recipes, while they serve for the older child, could not be used in preparing food for the baby under 2 years of age, and the authors would have done well to discuss the preparation of the food for the younger child. It seems also that too much attention is given to recipes for desserts, jellies and candies and too little to vegetables and cereals, which should form the bulk of the child's diet. Fish and poultry are given special chapter headings, which would tend to make the mother believe that they contain food elements differing from those found in other meats. The heading of the introductory chapter, "Inducing The Child To Eat," is in itself a bad piece of psychology, for many mothers spend too much time inducing the child to eat, instead of teaching him to eat by ignoring the eating problem altogether.

TEXTBOOK OF SURGICAL NURSING. By Ralph Colp, A.B., M.D., F.A.C.S., Instructor in Surgery, Columbia University, and Manelva Wylie Keller, B.S., R.N. Second edition. Leatherette. Price, $3.25. Pp. 514, with 173 illustrations. New York: Macmillan Company, 1929.

This is in reality a new work, since the book, which originally appeared in 1921, has been completely revised and the type reset. As in the previous edition, the authors have endeavored to present as accurately and simply as possible for the pupil nurse the actual detailed nursing of the various conditions related to things surgical. That the authors have succeeded is evidenced by the fact that the book has made its place as the textbook selected by the faculty in training schools throughout the country. Proper emphasis is given to the preoperative preparation and postoperative treatment. There have been notable developments in certain branches of surgery during the last eight years. Among these may be mentioned the more radical treatment of gastric and duodenal ulcers; the establishment of subtotal thyroidectomy as the standard operation for the treatment of toxic goiter, preceded by preoperative administration of compound solution of iodine and the corresponding infrequency of polar ligations or multiple stage operations; the passing over to the surgeon of bronchiectasis, lung tumors and tuberculosis of the lung; the tannic acid treatment of burns; spinal anesthesia, and cholecystography. Proper notice has been taken of these advances by the authors. The illustrations of equipment, instruments and the like are well selected, but this cannot be said of some of the photographs used to illustrate pathologic conditions, for example in the discussion of hernia. The cases presented are extreme in degree, and not only are not typical but even fail to give the student nurse any idea of the anatomy of the lesion. It would seem that a series of diagrammatic figures or line drawings would be much more helpful to a beginner. Similarly, the illustration of kidney with double ureters seems poorly chosen, for it is not only rare but of not the slightest significance so far as surgical nursing is concerned. The postoperative use of compound solution of iodine after thyroidectomy, which is not mentioned, is surely of practical interest and should be included. Except for some minor criticisms such as these, the new edition is to be highly praised and can be recommended as a valuable textbook for nurses.

LES ULTRAVIRUS ET LES FORMES FILTRANTES DES MICROBES: Les maladies à ultravirus—leurs caractères cliniques, anatomopathologiques, épidémiologiques — l'immunité — téchniques d'étude des ultravirus — les formes filtrates des bactéries. Par le Docteur Paul Hauduroy, préparateur à la Faculté de médecine de Paris. Paper. Price, 40 francs. Pp. 392, with illustrations. Paris: Masson & Cie, 1929.

The book, the first in the French language to deal in a systematic way with the group of filtrable viruses, gives a brief but lucid summary of the present state of knowledge of the several diseases attributed to viruses, and follows this review with a general physical and physiologic discussion. The last fourth of the book is devoted to the so-called filtrable forms of bacteria. The author accepts as demonstrated the existence of filtrable forms of the tubercle bacillus but does not consider them related to the true ultraviruses. The bibliography contains 155 references, of which about three fourths are French.

PRACTICE OF SURGERY: Clinical, Diagnostic, Operative, Postoperative. Volume VI. Edited by Dean Lewis, M.D., Sc.D., in Association with J. Shelton Horsley, M.D., E. Starr Judd, M.D., and George P. Muller, M.D. Gynaecology: Thomas S. Cullen, M.D. Urology: Herman L. Kretschmer, M.D. Art Editor: Tom Jones, B.F.A. Leather. Price, $137 per set of 12 volumes. Various pagination. Hagerstown: W. F. Prior Company, Inc., 1929.

This volume is devoted to the thyroid, stomach and duodenum, and spleen. In the first two chapters is included an extensive review of the diseases of the thyroid and parathyroid glands. Headings include anatomy, physiology, etiology, pathology, symptoms and treatment. The author has ironed out fairly well the confusions in classification so frequently found in discussions on the thyroid. The subject of hyperthyroidism is particularly well presented; the following chapters comprise the work on the stomach and duodenum—the relationship of the physiology of the stomach and duodenum to gastric and duodenal surgery, cardiospasm, gastric wounds, infection and hemorrhage, gastric ulcer, congenital hypertrophic stenosis, tumors, surgery of the duodenum, and surgery of the spleen.

The reader passes from one chapter to another, covering unrelated topics, without realizing the number of contributors responsible for the material presented. The illustrations are excellent, particularly those dealing with surgical technic—a most necessary feature in any work dealing with the operative surgery of either thyroid or stomach. Viewed as a unit, this is a particularly fine volume.

MODERN METHODS OF FEEDING IN INFANCY AND CHILDHOOD. By Donald Paterson, B.A., M.D., M.R.C.P., and J. Forest Smith, M.R.C.P., Physician to Out-Patients, St. Thomas's Hospital. Second edition. Cloth. Price, $3. Pp. 149, with 12 tables. New York: Paul B. Hoeber, 1929.

In this edition the work has been brought down to date by the rewriting of sections on vitamins, condensed milk and artificial foods, and instructions for preparing lactic acid milk. New chapters have been added on diets for sick children and children of school age, stools in infancy, and a description of the common articles of diet with their uses and digestibility. There are also chapters on infant foods, breast feeding, artificial feeding, mixed feeding, dyspepsias in infancy and constipation. The material is clearly presented, and all points are as thoroughly covered as is possible in a small monograph. The general practitioner as well as the pediatrician will find in this book many points which will be of great help in the feeding of the infant, both the breast fed and the artificially fed. Exact guides cannot be given for the amount of food that the average healthy infant needs, but the suggestions given here will help the physician in suiting whatever food is given to the infant's individual requirements. The book thus makes for the production of well fed babies.

THE AUTONOMIC NERVOUS SYSTEM. By Albert Kuntz, Ph.D., M.D., Professor of Anatomy in St. Louis University School of Medicine. Cloth. Price, $7 net. Pp. 576, with 70 illustrations. Philadelphia: Lea & Febiger, 1929.

In recent years an increasing attention has been directed to the vegetative nervous system both from a practical therapeutic as well as a theoretical standpoint. Enough proved facts have accumulated to permit of the summary of what is known in regard to the sympathetic innervation of various organs to be written in textbook form. The author has painstakingly discussed the detailed normal and pathologic anatomy, the physiology and the pathophysiology of the sympathetic nervous system in relation to individual organs. An excellent chapter on the practical surgical application completes the book. A complete bibliography is appended. The work is the only modern treatise on the subject written in English and fills a definite need.

HANDBUCH DER GEISTESKRANKHEITEN. Herausgegeben von Oswald Bumke. Band VI: Spezieller Teil. Teil 2. Bearbeitet von J. Lange, und F. Kehrer. Paper. Price, 37.10 marks. Pp. 376, with 37 illustrations. Berlin: Julius Springer, 1928.

This portion of Bumke's noteworthy series deals with the manic-depressive and the paranoid states. Written by Johannes Lange and F. Kehrer, it continues to maintain the high standard that the preceding volumes of this handbook have established. The encyclopedic thoroughness of the volumes make them indispensable for neuropsychiatrists.

NURSING IN EMERGENCIES. By Jacob K. Berman, A.B., M.D., F.A.C.S., Assistant in Surgery, Indiana University School of Medicine. Cloth. Price, $2.25. Pp. 160, with 109 illustrations. St. Louis: C. V. Mosby Company, 1929.

The author has prepared this booklet from the notes used in lecturing to nurses. The usual outlines of treatment of poisoning and of first aid measures are supplemented by directions for the control of hemorrhage, information concerning cardiac failure, fractures, wounds, bandaging, and obstetric and gastrointestinal emergencies. At least 20 per cent of the illustrations are unnecessary. Most of them are crude drawings. The picture of a stomach tube, of a doctor doing a tracheotomy on a patient who lies on the ground with his head in a nurse's lap, a gangrenous leg and the stitches in an end-to-end anastomosis are not especially useful or instructive. The chief advantage of the work is its outline form. This is at the same time a disadvantage, since the nurse is likely to see only indications and forget contraindications. As is usually said in all books on emergencies, the thing to do is to keep cool.

HISTORY OF BLOCKLEY: A History of the Philadelphia General Hospital from Its Inception, 1731-1928. Compiled by John Welsh Croskey, M.D. Cloth. Pp. 765, with 15 illustrations. Philadelphia: F. A. Davis Company, 1929.

The Philadelphia General Hospital is one of the oldest and most important institutions of its type in the United States. The men who have been associated with the hospital in recent years have collaborated to produce an historical work concerning it, which provides at the same time what is almost a medical history of Philadelphia. The work includes essays by Drs. Croskey, Agnew, Mills, Doane and Da Costa concerning various epochs in the history of the hospital, biographies of all the physicians now deceased who served in the hospital, and a list of living men who have been attached to the institution. The work of the school of nursing is reviewed by S. Lillian Clayton. The book is handsomely printed and well illustrated and forms a real keepsake for all those who have been associated in any way with Blockley.

VARICOSE VEINS WITH SPECIAL REFERENCE TO THE INJECTION TREATMENT. By H. O. McPheeters, M.D., F.A.C.S., Director of the Varicose Vein and Ulcer Clinic, Minneapolis General Hospital. Cloth. Price, $3.50 net. Pp. 208, with 35 illustrations. Philadelphia: F. A. Davis Company, 1929.

The author has written this book from special knowledge and study of his subject. The number of cases actually cared for and treated by him approximate 800; the number in the literature which he has reviewed exceed 50,000. The anatomy of normal veins is considered; then of varicose veins, with comment on the changes that occur and the general effect that they have on the circulation of the lower extremities. The author classifies varicose veins according to their diameter, which is different from the classification of Bernstein and Virchow and probably of more importance. The different theories of etiology are discussed and evaluated, as are points in the diagnosis and differential diagnosis. Two chapters are devoted to varicose ulcer, the most important complication of varicose veins, with attention to its characteristics, differentiation from ulcers of other etiology, and treatment. All general factors in the treatment of varicose veins are considered, with a review of the operative and mechanical methods that have now given way to injection as the method of choice. The injection treatment is considered in detail, with regard to history, technic, solutions, results and complications. The author prefers a solution of calorose (invert sugar, 75 per cent; cane sugar, 5 per cent). There are short chapters on hemorrhoids and elephantiasis. It is an excellent book. It presents facts and figures, and essentials in anatomy, pathology, treatment and results in a concise yet comprehensive manner.

THERAPEUTISCHE VADEMECUM FÜR DIE KINDERPRAXIS. Von Prof. H. Kleinschmidt, Direktor der Universitäts-Kinderklinik in Hamburg. Sixth edition. Paper. Price, 6.60 marks. Pp. 256. Berlin: S. Karger, 1929.

This guide for treatment in pediatric practice was first published in 1918. The present edition has been completely revised and brought down to date with the most recent therapeutic advances. Nutrition of the sick child, management of the diabetic patient, rickets, skin diseases and prophylaxis and treatment of infectious diseases have received more detailed attention than in previous editions. The volume covers the field and reflects the author's personal opinions on the management of the most important disorders encountered in this field and contains dietary directions for the sick child as well as the normal baby. It will serve as a guide and reference work and should be useful to students and practitioners as a therapeutic vade-mecum.

SURGICAL RADIOLOGY. By A. P. Bertwistle, M.B., Ch.B., F.R.C.S. With an introduction by D. P. D. Wilkie, O.B.E., F.R.C.S., Professor of Surgery, University of Edinburgh. Cloth. Price, $3.50 net. Pp. 142, with 21 illustrations. Philadelphia: P. Blakiston's Son & Company, 1929.

This book gives brief paragraphs covering the roentgenologic phases of surgical conditions. There is little extended treatment of any one subject. The material is divided according to the various systems, such as alimentary, urinary, nervous and dental. The illustrations are of high order, with explanatory diagrams on each of the illustrations which bring out the principal points concerned.

Medicolegal

Lymphosarcoma Attributed to Trauma

(Schwartz v. Woodmen Acc. Co. (Wis.), 223 N. W. 844)

Esther Schwartz obtained a judgment against the defendant company on an accident insurance policy issued to her husband, Henry Schwartz, which provided for certain benefits in case death resulted through violent, external and accidental means entirely independent of all other causes. The defendant appealed to the supreme court of Wisconsin, where the judgment of the trial court was affirmed.

The principal issue litigated was whether the evidence sustained the finding of the jury that the death of Schwartz was caused by his injury entirely independent of all other causes. June 15, 1927, Schwartz, a truck driver, received an injury to his left arm, apparently while cranking the truck. He consulted Dr. Dana, who found a swelling and slight discoloration of the forearm, but the injury was not considered serious. Dr. Gavin was later called in consultation. Schwartz continued to work, with the aid of a helper, for three or four days, but on about the fourth or fifth day a swelling of the epitrochlear glands developed. A few days later the axillary glands under the arm became swollen and on June 28 he had a severe axillary hemorrhage, which was only partially controllable. Schwartz was taken to a hospital, where an incision was made in the arm to localize the pus but none was found. The incision resulted, however, in an uncontrollable hemorrhage from the arm. A transfusion of blood was made through the right arm, and there was no bleeding from the wound in which the tube was inserted. Examinations showed that there were no involvements of the glands in the groin, of the axillary glands under the right arm, of the glands in the neck, or in the chest. Nor were there any involvements of the spleen that could be determined. A nasal hemorrhage developed which could not be checked. Schwartz died, July 2. Specimens taken from the arm of the deceased were declared by two pathologists to be those of lymphosarcoma. A third declared them to be those of a round cell sarcoma. Two of the pathologists testified that death was due to the presence of sarcoma and did not result from the injury, and that the lymphosarcoma must have been present at the time of the injury because it could not develop so as to cause death within a period of fifteen days. On the other hand, Dr. Dana, Dr. Gavin and one of the pathologists testified that death was due to the injury. The defendant objected to the testimony of Drs. Dana and Gavin, contending that since they were not pathologists they were not qualified to testify. The supreme court disagreed with this contention. A knowledge of pathology, the court said, enabled the pathologists to examine the specimens and determine their character. Drs. Dana and Gavin did not pretend to be able to determine the character of the specimens, but they were familiar with lymphosarcoma, its character, growth and development, in a general way. Conceding the presence of the lymphosarcoma, they were qualified to testify whether in their opinion death was the result of sarcoma or of the accident. It was generally conceded that, if the sarcoma was present at the time of the accident, in order to cause death within fifteen days it had a speedy and most unusual progress. On the other hand, at the time of the accident Schwartz was 35 years of age and appeared to be in good health and vigor. If he had, at the time of the accident, lymphosarcoma of such a stage of development that death resulted within fifteen days thereafter, it was a most unusual circumstance, the court thought, that his general appearance and health showed no indication of it. There was another consideration of importance, the court said. Lymphosarcoma originates in the glands of the body. Its course is generally marked by progress from one gland to another in a chain of glands, although it is said that it sometimes jumps from one chain of glands to another. The sarcoma in this case was found in the most remote gland of the arm. Its progress must necessarily have been inward, toward the center of the body. The nearest glands to the one affected, the axillary glands under the arm, were involved. But such was not the case with the glands of the neck, or any other gland so far as discovered. From this evidence, the court said, it would appear that the sarcoma had not existed for a sufficient length of time to make any great progress from one gland to another.

Whether a lymphosarcoma may result from trauma was declared by the court to be uncertain. One of the pathologists testified that scientific men who have made a study of this disease in pathology cannot say what is the cause of lymphosarcoma. Another testified that the blow did not have anything to do with the development of the lymphosarcoma, but he did not testify that a trauma might not give rise to a lymphosarcoma. Dr. Edward F. Tharinger, another pathologist, testified as follows:

> Ordinarily we aren't able to say what causes this type of tumor, or for that matter practically all types of tumor, the exact cause is not known. It is only in certain types of individuals that tumors do follow injury. The entire medical profession is agreed, at least so far as I have been able to find out, that under certain circumstances, granting a single cause is not known, under certain circumstances tumors result at the site of injury—and following the injury, so that they agree that the injury has some influence, at least, and perhaps if the injury had not occurred the tumor perhaps would not be there, but they all realize even in such case there is some other factor or underlying tendency there, that the person is probably susceptible to that condition; maybe it is a process already there which is lit up. I never in my experience saw a case of lymphosarcoma that developed from an injury.

The evidence was not convincing, the court said, but it afforded a substantial basis for the verdict of the jury. While the trial court erred in permitting Drs. Dana and Gavin to testify that Schwartz told them he injured his arm while cranking a car, such evidence being hearsay, there was abundant competent evidence to establish an injury to his arm through external and accidental means. The error, therefore, was not regarded as prejudicial.

Negligent Treatment Provable by Lay Witness

(McMillen v. Foncannon (Kan.), 274 P. 237)

The plaintiff sued the defendant, a physician, alleging negligent treatment of a fracture of his arm. The trial court sustained a demurrer to the evidence of the plaintiff, who thereupon appealed to the supreme court of Kansas, where the judgment of the trial court was reversed, with directions to grant a new trial.

The plaintiff, Feb. 2, 1925, sustained an injury to his arm and the defendant was called to treat the injury. He examined the injured arm and told the plaintiff that one of the bones of the arm was broken. Repeatedly throughout the treatment, which continued until March 13, the plaintiff complained of severe pain in the elbow, but the defendant each time informed him that there was nothing wrong with it. The defendant made no roentgenograms of the arm after the day of the injury nor did he examine it before a fluoroscope after the second visit. March 13, the defendant removed the bandage and told the plaintiff to use the arm. At that time the arm was about two inches shorter than the other arm and there was a lump on it near the break. The plaintiff was discharged as a patient on that date, with the assurance that the lump would disappear. The evidence showed that the plaintiff thereafter did some light work and that "he could lift straight up with his arm, but if he held it horizontally it fell with its own weight."

The plaintiff complained of the ruling of the trial court in excluding certain roentgenograms which were made of his arm subsequent to his discharge by the defendant. The trial court erred in excluding them, the supreme court held. The roentgenograms clearly disclosed that there was a dislocation of the radius at the elbow, that the ends of the bone at the break in the ulna were not in apposition but overlapped, and that the bone had not knit at the place of the break. They were, therefore, material evidence and, having been properly identified, they should have been admitted.

The defendant contended that the plaintiff's evidence showed only a bad result and that he could not be held liable when nothing more was shown. It is true, the court said, that a bad result, standing alone, does not establish liability. When the plaintiff shows a bad result, however, he establishes at least a material part of his case, since there can be no recovery unless there is a bad result, or injurious consequences. The defendant further contended that there was no medical evidence to show

what was the proper treatment of the plaintiff's arm and that no witness schooled in the science of medicine testified that the defendant was negligent in his treatment of the plaintiff. While the general rule, the court said, is that what is the proper treatment to be used in a particular case is a medical question to be testified to by physicians as expert witnesses, the rule applies only to those matters clearly within the domain of medical science. Matters within the common knowledge of mankind may be testified to by any one familiar with the facts. That it was negligent not to set or to treat a badly dislocated elbow need not be established by a medical witness since it is a matter of common knowledge that such an injury needs treatment. The evidence in this case showed that it received no treatment. Neither does it require medical evidence to justify a jury in finding negligence in dismissing a patient as practically well when the forearm was about two inches shorter than normal and, when the arm was held in a horizontal position, the end would drop with its own weight. Any layman, the court said, would know that this condition could not exist unless the ends of the bone, where it was broken, were overlapped and had not grown together to make it rigid. The evidence was sufficient, the court said, to take the case to the jury and the trial court erred in sustaining the demurrer to the plaintiff's evidence.

Horseradish as a Remedy for Tuberculosis Not Patentable

(In re Trattner (U. S.), 30 Fed. (2d) 879)

Rosa K. Trattner applied for letters patent for a preparation designed especially for the treatment of diseases of the lungs, as, for instance, tuberculosis and like ailments. The preparation consisted of grated horseradish, boiled in honey to the consistency of a jelly, two or three tablespoonfuls to be taken, cold, about midway between meals, with "Balm of Gilead" as a tea. This mixture, the applicant claimed, "aids to thicken the blood; relieves the anaemic condition; builds up the system; throws off disease, and heals the lungs rapidly, accomplishing this in two or three months if taken regularly." In the Patent Office, the application was rejected by the examiner, and his decision was affirmed by the board of appeals. An appeal was thereupon taken to the court of appeals of the District of Columbia, which affirmed the action of the Patent Office.

Concerning horseradish, the court quotes from some unnamed edition of the "American Dispensatory":

> The grated root with sugar to form a syrup with water, is excellent for hoarseness; a spoonful or two may be swallowed as occasion requires.

And some unnamed edition of Foster's Medical Dictionary is quoted to the following effect:

> It [horseradish] is used as a condiment and medicinally as a remedy in scurvy, as a stomachic tonic, and, both externally and internally, in paretic conditions and chronic rheumatism. . . . A mixture of one part of the juice of wild horseradish root and four parts of honey.

For information about the medicinal value of honey, the court relies again on the "American Dispensatory:"

> A very excellent preparation for coughs, especially during febrile or inflammatory attacks, is composed of honey, olive oil, lemon juice, and sweet spirits of niter, each one fluid ounce, to be taken several times a day in half-fluidrachm or fluidrachm doses.

And to the same authority the court resorted for its information about the medicinal value of the balm of Gilead:

> Populus (Balm of Gilead) buds are reputed stimulant, tonic, diuretic and antiscorbutic. A tincture of them has been beneficially employed in affections of the chest, stomach, and kidneys, and in rheumatism and scurvy. . . . Dose of a tincture of the buds, from one to four fluidrachms, which is excellent for colds and pain in the chest.

Letters patent were properly denied, therefore, according to the court of appeals, because the record did not show that the combinations described by the would-be patentee result in any new chemical composition and because it is fair to assume that they are mere aggregations. Moreover: "The references disclose that the medicinal value of the various ingredients composing the applicant's preparation has long been known to the public and serve as an anticipation of appellant's claim."

Workmen's Compensation: Injury to Shoulders and Chest; Death under Operation for Cancer of Stomach; Award Affirmed.—The deceased died under an operation to relieve a gastric obstruction, found to be due to a cancer of the stomach, July 16. At the time of the operation he had been continuously in the hospital since April 17, as the consequence of a severe injury to his shoulders and chest in the course of his employment. He was strong and rugged at the time of the accident, weighing about 186 pounds (84.4 Kg.), but before he died, three months later, his weight had fallen to about 135 pounds (61.2 Kg.). The claimant contended that her husband's failure to survive the operation was due to a debilitated condition, resulting from the injury and the consequent confinement and treatment. The defendant contended that it was due to an independent intervening cause. Where the testimony discloses two possible causes of death, it is for the jury to determine which is the proximate cause. The jury found that had it not been for the injury, and the lowered resistance and impaired vitality directly caused by the injury, the deceased would not have died when he did. Judgment in favor of the claimant was affirmed.—*Baker v. State Industrial Accident Commission (Ore.), 274 P. 905.*

Limitation of Sale of Standard Drugs in Original Packages; Statute Held Valid.—An act restricting to registered pharmacists the right to sell even in original packages medicines other than "patent" and proprietary medicines is not unconstitutional because of that restriction; nor is it unconstitutional because it authorizes the issue, in the discretion of the board of pharmacy, of a special permit to sell simple household remedies, to any dealer three miles or more distant from the establishment of the nearest registered pharmacist.—*Ex parte Gray (Calif.), 274 P. 974.*

Malpractice: Dentist's Neglect in Treatment of Impacted Tooth.—The evidence in this case tended to show that the defendant, a dentist, treated the plaintiff's jaw several weeks after he made an unsuccessful attempt to remove an impacted wisdom tooth. He then dismissed the case, advising the plaintiff in effect that she needed no further professional attention. A few days later, another dentist extracted the tooth, apparently with little difficulty, and found the jaw infected. Pus flowed freely from the wound. The expert testimony offered to establish the defendant's negligence was meager, said the supreme court of Kansas, but the court thought it was sufficient to uphold the verdict of the jury in favor of the plaintiff.—*Nance v. Beatie (Kan.), 274 P. 219.*

Narcotics: Possession by Physician, When Lawful.—Narcotics may be lawfully possessed by a physician, under chapter 241. Laws of Kansas, 1927, only when possessed for the purpose of use in the course of his practice as a physician. The supreme court of Kansas, therefore, sustained the conviction of the defendant, a physician, on a charge of unlawful possession of narcotics where the evidence tended to show that he diverted morphine in his possession to other than professional uses.—*State v. Miller (Kan.), 274 P. 245.*

Society Proceedings

COMING MEETINGS

American Academy of Physical Therapy, Philadelphia, December 5-6. Dr. Thomas L. Smyth, 111 North Eighth Street, Allentown, Pa., Sec'y.

American Society of Tropical Medicine, Miami, Fla., November 20-22. Dr. Edwin Peterson, U. S. Naval Hospital, Washington, D. C., Sec'y.

Radiological Society of North America, Toronto, December 2-6. Dr. I. S. Trostler, 25 East Washington Street, Chicago, Acting Secretary.

Society of American Bacteriologists, Ames, Iowa, December 30-January 1. Dr. James M. Sherman, Cornell University, Ithaca, N. Y., Secretary.

Southern Medical Association, Miami, Fla., November 20-22. Mr. C. P. Loranz, Empire Building, Birmingham, Ala., Secretary.

Southern Surgical Association, Atlanta, Ga., December 10-12. Dr. Robert L. Payne, 142 York Street, Norfolk, Va., Secretary.

Western Surgical Association, Del Monte, Calif., December 12-14. Dr. Frank R. Teachenor, 306 E. Twelfth St., Kansas City, Mo., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Ophthalmology, Chicago

12: 793-870 (Oct.) 1929

Divergence Excess. C. Berens, LeG. H. Hardy and E. Stark, New York.—p. 793.
Blind Spot. H. S. Gradle and S. J. Meyer, Chicago.—p. 802.
Intensity of Illumination and Other Factors Influencing Sensitivity of Radial Test for Astigmatism. C. E. Ferree and G. Rand, Baltimore.—p. 809.
Rôle of Unlevel Orbits in Heterophoria. A. L. Brown, Cincinnati.—p. 815.
Tuberculous Dacryo-Adenitis. M. P. Motto and E. H. Rowen, Cleveland.—p. 818.
Monocular Blindness from Light of Electrical Origin: Case. J. N. Roy, Montreal.—p. 822.
Retinal Detachment Following Administration of Insulin. G. M. McBean, Chicago.—p. 825.
Cataract: Two Unusual Cases. M. M. Cullom, Nashville, Tenn.—p. 825.
Hernia of Vitreous Two Days After Cataract Extraction. S. Sanyal, Calcutta, India.—p. 826.
Spasmodic Occlusion of Central Retinal Artery, Early Restoration of Blood Flow, but no Useful Vision. G. L. King, Jr., Alliance, Ohio.—p. 827.
Ophthalmic Reference in Will of Rabbi of Fourteenth Century. A. Brav, Philadelphia.—p. 828.
Senile Cataract Improved by Diabetes? T. H. Shastid, Duluth, Minn.—p. 828.
Hot Eyelids and Cold. T. H. Shastid, Duluth, Minnesota.—p. 829.

American J. Public Health, New York

19: 1081-1186 (Oct.) 1929

Streptococcus of Septic Sore Throat. W. D. Frost, R. C. Thomas, M. Gumm and M. Shaw, Madison, Wis.—p. 1081.
*Endemic Goiter in Louisville and Jefferson County Schools. W. O. Johnson, Louisville, Ky.—p. 1090.
*Contact Carriers in Meningitis. J. F. Norton, Detroit.—p. 1098.
Sudden Heart Failure as Public Health Menace. A. S. Hyman, New York.—p. 1103.
Endemic Goiter and Relation to Iodine Content of Food. J. A. Hayne, Columbia, S. C.—p. 1111.
Industrial Cleanliness and Courts. J. A. Tobey, New York.—p. 1119.
Voluntary Agencies' Activities in City Health Education Program. B. Marquette, Cincinnati.—p. 1123.
Educational Aspects of Dairy and Milk Inspection. C. L. Roadhouse, Davis, Calif.—p. 1129.
New Suspending Medium Used for Intracutaneous Virulence Test of Bacillus Diphtheriae. R. V. Stone and C. Weigel, Los Angeles.—p. 1133.

Endemic Goiter in Louisville and Jefferson County Schools.—A survey made by Johnson of 5,083 girls in Louisville city high schools and eighth grades, and of boys and girls in nine county schools, with 677, or 13.31 per cent, adolescent goiter cases, found a predominance of adenoma and typical adolescent goiters in the county, with 10 per cent higher family incidence of goiter where, in spite of open, hygienic life, goiters develop when the family incidence is high. These adolescent goiters came from local stock, and not from families of goitrous districts. The family history is 14 per cent higher among goiters than among nongoiters, and 20 per cent higher among the mothers of goitrous patients than of nongoitrous, the condition appearing in mothers in 60 per cent and in sisters in 20 per cent of the cases. The age predominance in Kentucky for adolescent goiter is somewhat higher than the beginning of adolescence, being on an average 14.6 years, and the county school children a year earlier. Teeth without decay were more frequently found among nongoitrous children in both county and city. In the county cases dental hygiene was slightly better than in the city cases. The extreme grades of dental neglect were more often found among those having the larger goiters. Large cryptic tonsils were more often among the goiter cases, and a greater number of nongoitrous children had had tonsillectomies than goitrous children. Chest expansion of those with goiter averaged 1 inch less than of those without. Use of iodized salt was greater in the city, where goiter was 5.4 per cent higher than in the county, where 20 per cent less iodized salt was used. Iodized salt does not seem to be efficient as a prophylactic.

Contact Carriers in Meningitis.—Norton reports the results obtained by taking cultures of 2,892 home contacts with 619 cases of epidemic meningitis over a period of six months. The percentage of carriers to contacts varied weekly, from 0 to 65.6 per cent. The highest percentages were found during the winter and early spring months, and the lowest during June and July. More than one nasopharyngeal culture is needed to detect a considerable number of carriers. Sex and age play no part in the tendency to become a carrier. The number of persons in a house has no relation to the percentage of carriers found. Carriers persist for two weeks as frequently in warm as in cold weather, although the actual number of carriers is greatly diminished. As a result of measures instituted for the control of home contacts with cases of epidemic meningitis, 70 per cent of meningococcic carriers have been isolated until the carrier condition has terminated.

Archives of Surgery, Chicago

19: 567-770 (Oct.) 1929

*Air Embolism from Pulmonary Vein. C. M. Van Allen and L. S. Hrdina, Chicago, and J. Clark, Iowa City.—p. 567.
*Experimental Peptic Ulcer. J. C. McCann, Rochester, Minn.—p. 600.
*Loose Cartilage from Intervertebral Disk Simulating Tumor of Spinal Cord. W. E. Dandy, Baltimore.—p. 660.
*Renal Counterbalance. J. J. Joelson, C. S. Beck and A. R. Moritz, Cleveland.—p. 673.
Delbet Apparatus and End-Results. E. T. Crossan, Philadelphia.—p. 712.
*Trauma to Central Nervous System. A. Blalock and H. B. Bradburn, Nashville, Tenn.—p. 725.
*Thrombo-Angiitis Obliterans. M. E. Barron and H. Linenthal, Boston.—p. 735.
Thirty-Ninth Report of Progress in Orthopedic Surgery. P. D. Wilson, L. T. Brown, M. N. Smith-Petersen, R. Ghormley, J. Kuhns and E. Cave, Boston, M. S. Danforth, Providence, R. I., G. Perkins, London, England, and A. Van Dessel, Louvain, Belgium.—p. 752.

Air Embolism from Pulmonary Vein.—The subject of air embolism from the pulmonary vein is considered by Van Allen et al. as to etiology, distribution of the air in the circulation, physiologic reaction, tolerance, cause of death, diagnosis, prognosis, prevention and treatment. Under each of these captions is given a review of the present knowledge and original clinical and experimental observations and deductions. Particular emphasis is placed on the following conclusions: Bronchovenous fistula may be produced by simple thoracentesis and may form a portal of entry for air into the pulmonary veins. Gravity is a determining factor distributing air in the blood circulation. Embolism of the heart (coronary) and brain are the vital effects. The position of the animal determines which of these is primary in a given case. Tolerance for embolism is greatest when the head of the animal is well depressed and least with the head up. Diagnosis is aided by two characteristic and easily elicited signs: elevation of the initial blood pressure and "air bleeding." Prevention is certain by employing positive pressure breathing, when an external venous fistula is present, or by bronchial block, when a bronchovenous fistula exists. Treatment, although effective under ideal circumstances, is not practical.

Experimental Peptic Ulcer.—McCann reviews the literature and gives the results of his work on peptic ulcer produced experimentally by the methods devised by Mann. Following operation, typical ulcers of the jejunum formed in approximately 80 per cent of a series of twenty-six dogs. The ulcers usually formed within from one to three months. Some of them perforated, causing sudden death. Others were first suspected when the dogs began to refuse food and lose weight. If the dogs were etherized at this time, ulcers of the anastomosed jejunum were usually found. The variations in the length of time in which the ulcers formed preclude the possibility that operative trauma, thrombosis of vessels or cachexia are the essential factors concerned in producing these lesions. Usually single, but sometimes multiple, ulcers were found. They were situated just beyond the suture line and were usually regressive up to the gastric mucosa. The acute ulcers were cleanly punched out, suggesting a rapidly progressing type of lesion. The three layers of the intestinal wall, the mucosa, muscularis

and serosa, were all extensively involved. The subacute ulcer, which was the type most frequently seen, gave definite evidence of early chronicity. The chronic indurated ulcers possessed all the characteristics of the crater type of ulcer observed in man. The basis for the production of these experimental ulcers has been attributed mainly to the mechanical and chemical factors involved in the physiologic functions of this region. Two of the specimens in this series presented significant evidence of the influence of the two mechanical factors involved: the force of the stream ejected through the pylorus and the friction of coarse cellulose foods. In the early studies by Mann and his colleagues in which the original method of surgical duodenal drainage had been used, ulcers were produced by entirely eliminating the alkalis from the pyloric region and exposing the segment beyond the pylorus to the full autolytic action of the gastric chyme. In McCann's studies the alkalis are still retained in the upper part of the intestinal tract but proximal to the pylorus; this allowed the uncontrolled autolytic action of the gastric chyme to persist beyond the pylorus. The resulting lesions indicated that one rôle of the alkalis, in the normal physiologic relationship, is to prevent the formation of ulcer, not by any specific protective action, but by some type of buffer or diluting action beyond the pylorus that terminates the acid peptic activity of the gastric chyme. The results of these experiments emphasize the importance of the mechanical factors in causing chronic peptic ulcers. Chemical studies demonstrated that the gastric mucosa possesses considerable immunity to the autolytic activity of the acid and pepsin secreted by the stomach, whether exposed to it for a normal period or for a prolonged period, because spontaneous experimental ulcers of the chronic type produced in these experiments never developed in the stomach. Likewise, the normal duodenal mucosa is completely immune to this activity under the condition of a normal relationship between the acid chyme ejected through the pylorus and the neutralizing secretions present in the duodenum. McCann encountered two instances of autolysis of the gastric mucosa. The phenomenon was unexpected and was observed after an operative procedure in the study of experimental peptic ulcer. McCann concludes it is probable that the mucous secretion of the stomach by virtue of its capacity to combine with free acid forms the principal defense of the gastric mucosa against autolysis.

Loose Cartilage from Intervertebral Disk Simulating Tumor of Spinal Cord.—Dandy asserts that following slight (or repeated) trauma a fragment of an intervertebral disk may become detached and eventually bulge into the spinal canal as a tumor. The "tumor" is composed of the cartilage and fluid formed by reaction to the foreign body. Two instances of this lesion are reported, both being disclosed at operation. Both were in the midlumbar region, and both occurred in men during the latter half of life. The early symptoms were those of localized vertebral pain plus bilateral sciatica, one side being affected more than the other. Later, the symptoms are rapidly increasing paralysis, sensory and motor paralysis and loss of urinary and vesical control and of reflexes, all due to compression of the cauda equina. The signs and symptoms suggest carcinoma of the vertebra. This preoperative diagnosis was made in both cases. This lesion offers a pathologic basis for cases of so-called sciatica, especially bilateral sciatica. The lesion is cured by operative removal of the cartilage.

Renal Counterbalance.—On the basis of their experimental study, Joelson et al. assert that the theory of renal counterbalance need not be seriously considered in deciding the surgical treatment for certain renal lesions.

Trauma to Central Nervous System.—The effects on the pulse rate, temperature, maximum and minimum arterial blood pressures, arterial and venous oxygen content, consumption of oxygen and cardiac output were studied by Blalock and Bradburn after (1) the operative procedure that was necessary for the exposure of the dura, (2) the opening of the dura, and (3) trauma to the central nervous system in the cerebrum, cervical cord and thoracic cord. In some instances the operation that was necessary for the exposure of the dura and the opening of the dura did not cause any decrease in the arterial blood pressure or in the cardiac output. Trauma to the central nervous system caused a diminution of the maximum and minimum arterial pressure and the cardiac output. The pulse rate usually increased before the blood pressure and cardiac output altered. The blood pressure and the cardiac output apparently changed simultaneously. The alterations in the consumption of oxygen were variable, but in the majority of instances trauma caused no appreciable alteration from that of the control period. In the majority of instances, changes in body temperature were negligible.

Thrombo-Angiitis Obliterans.—Analysis of thirty-four cases made by Barron and Linenthal demonstrated that this disease is not confined to vessels of the extremities, as is generally accepted, but is a generalized disease that may affect any part of the arterial tree, including the coronary arteries, the abdominal arteries and the arteries of the brain.

Arkansas M. Soc. Journal, Little Rock

26: 73-94 (Sept.) 1929

Pericarditis with Effusion. W. G. Hodges, Malvern.—p. 73.
Heart Irregularities. A. G. Sullivan, Hot Springs National Park.—p. 76.
Angina Pectoris. L. F. Barrier, Little Rock.—p. 78.

Florida Med. Assn. Journal, Jacksonville

18: 393-443 (Sept.) 1929

Maculo-Anesthetic Leprosy. J. L. Kirby-Smith, Jacksonville.—p. 107.
Woodruff Catheter Technic in Modern Cystoscopy and Ureteropyelography. R. J. Holmes and M. M. Coplan, Miami.—p. 112.
Undulant Fever: Case Traced to Cow. L. M. Blackford, Atlanta and T. Z. Cason, Jacksonville.—p. 115.
Vaccine and Serum Therapy in Pediatrics. W. McKibben, Miami.—p. 117.

Georgia M. Assn. Journal, Atlanta

16: 393-443 (Sept.) 1929

Arthritis Deformans. W. S. Baer, Baltimore.—p. 393.
Learning Therapeutics. W. R. Houston, Augusta.—p. 403.
Clinics for Children of Preschool Age in Atlanta. L. D. Hoppe, Atlanta.—p. 410.
Psychiatric Studies Among School Children. G. L. Echols, Milledgeville.—p. 413.
Why I Belong to My Professional Association. A. D. Little, Thomasville.—p. 422.

Journal of Experimental Medicine, Baltimore

50: 407-550 (Oct. 1) 1929

Serologic Differentiation of Steric Isomers (Antigens Containing Tartaric Acids). K. Landsteiner and J. van der Scheer, Baltimore.—p. 407.
Antibody Formation by Polysaccharids. S. Nishimura, Tokyo, Japan.—p. 419.
Antibody Response in Human Being After Injection with Normal Horse Serum. L. Tuft and S. G. Ramsdell, Philadelphia.—p. 431.
Effects of Cathode Rays on Proteins of Serum. L. E. Baker and R. B. Corey, Baltimore.—p. 439.
Cell Proliferation Response to Sulfhydryl in Mammals. F. S. Hammett and S. P. Reimann, Philadelphia.—p. 445.
Antibody and Agglutinin in Pneumococcus Pneumonia. F. T. Lord and G. E. Nesche, Boston.—p. 449.
*Etiology of Oroya Fever: XVI. Verruga in Dog and Donkey. H. Noguchi, H. R. Muller, E. B. Tilden and J. R. Tyler, Baltimore.—p. 455.
*Differentiation of Hemolytic Streptococci of Human and Dairy Origin by Methylene Blue Tolerance and Final Acidity. R. C. Avery, Nashville, Tenn.—p. 463.
*Tissue Maintenance: III. Persisting Bloodlessness After Functional Ischemia. H. P. Gilding and P. Rous, Baltimore.—p. 471.
*Final Response of Small Cutaneous Vessels. P. Rous and H. P. Gilding, Baltimore.—p. 489.
Bacillus Typhosus Toxic Substances: III. Effect of Sera on Injury Producing Factors of Phenomenon of Local Skin Reactivity. G. Shwartzman, New York.—p. 513.
Chemo-Immunologic Studies on Conjugated Carbohydrate-Proteins: I. Synthesis of p-Aminophenol B-Glucoside, p-Aminophenol B-Galactoside, and Their Coupling with Serum Globulin. W. F. Goebel and O. T. Avery, Baltimore.—p. 521.
Id.: II. Immunologic Specificity of Synthetic Sugar-Protein Antigens. O. T. Avery and W. F. Goebel, Baltimore.—p. 533.

Verruga in Dog and Donkey.—In the experiments reported by Noguchi et al., definite verruga lesions, in which the presence of *Bartonella bacilliformis* was established by culture or by passage to rhesus monkeys, were produced in a dog and in a donkey by inoculation of cultures or monkey passage strains. The reaction induced in these animals was entirely local; however; blood cultures were sterile. Histologically, the lesions produced were similar to those obtained in monkeys by inoculation of *Bartonella bacilliformis*, except for the presence of a marked polymorphonuclear leukocytic exudate. In another donkey a lesion histologically suggestive of verruga was produced, while in one donkey and a horse the results of inocula-

tion were negative or indefinite. The intravenous injection of a filtrate or of heat-killed cultures of *Bartonella bacilliformis* into two donkeys was followed by the appearance of large, soft, subcutaneous swellings, on various parts of the body, not resembling in any way verruga lesions.

Differentiation of Hemolytic Streptococci of Human and Dairy Origin by Methylthionine Chloride Tolerance and Final Acidity.—A grouping of 138 strains of hemolytic streptococci based on differences in dye sensitiveness and in final hydrogen ion concentration of cultures is presented by Avery. Three groups are distinguished: (1) human parasitic strains, defined by a final p_H range of 5.2 to 5.0 and by failure to reduce methylthionine chloride (methylene blue-U. S. P.), 1:5,000, in milk; (2) bovine parasitic in the udder, characterized by a final p_H range of 4.5 to 4.2, and by failure to reduce methylthioine chloride, 1:5,000, in milk, and (3) saprophytic strains, characterized by a final p_H range of 4.5 to 4.2, and by ability to reduce methylthionine chloride. Methylthionine chloride was bactericidal for the strains of hemolytic streptococci that fail to reduce it but neither bacteriostatic nor bactericidal for the strains that caused its reduction.

Persisting Bloodlessness After Functional Ischemia.—Gilding and Rous found that in skin regions which have been bloodless for some time as the result of the functional readjustments following a reduction of the blood bulk, the ischemia persists long after the blood volume has been restored and the systemic blood pressure has mounted to the initial level or a higher one. The significance of the finding is discussed.

Final Response of Small Cutaneous Vessels.—A study made by Rous and Gilding of the blanchings (Bier's spots) which develop in human skin deprived of circulation has proved them referable to the same general causes that lead to ischemic patching of the skin of animals, and that they are conditioned by the same factors. Both are expressions of a secondary contraction of vessels that have become hyperirritable owing to an inadequate circulation. The contraction is favored by emptying the vessels, but it occurs pronouncedly even when there is a trickle through them of arterial blood. In the case of man the contractile impulse is sometimes so great as to overcome the maximum pressure that the vessels will support.

Journal of Nerv. & Mental Diseases, New York

70: 353-464 (Oct.) 1929

*Parathyroid Therapy in Schizophrenia. K. M. Bowman, Boston.—p. 353.
Nature of Two Forms of Neuroglia. A. E. Taft and S. DeW. Ludlum, Philadelphia.—p. 360.
New Cajal Institute. A. L. Skoog, Kansas City, Mo.—p. 369.
*Interparoxysmal Respiratory Rate of Epileptics. S. M. Weingrow, New York.—p. 373.
Inherited Neurosyphilis. M. G. Masten, Madison, Wis.—p. 379.
Brain and Psyche. M. Reichardt, Würzburg.—p. 390. (Translated by F. I. Wertham, Baltimore.)

Parathyroid Therapy in Schizophrenia.—Bowman reports his experience with intravenous injections of parathormone and calcium lactate by mouth in cases of schizophrenia. He was unable to secure a marked rise in the calcium content of the blood, and did not obtain any specific decrease of muscular tension. There was no clear evidence of any relationship between the calcium content of the blood and parathyroid activity, on the one hand, and catatonic states on the other.

Interparoxysmal Respiratory Rate in Epilepsy.—Weingrow states that the range of the interparoxysmal respiratory rate of adult essential epileptic males differs from that of the normal. Phenobarbital medication extending over periods of years does not affect the limits of this range in the individuals studied. The average respiratory rate of idiopathic and symptomatic adult male epileptic patients under or not receiving phenobarbital falls within normal limits. Sleep per se had little effect on the respiratory rate in the cases studied. The effect on the interparoxysmal respiratory rate in epileptic individuals of drugs superimposed on phenobarbital needs further study.

Maine M. Assn. Journal, Portland

20: 137-154 (Sept.) 1929

Subarachnoidal Anesthesia. W. D. Anderson, Portland.—p. 137.
Acidosis and Alkalosis. S. H. Kagan, Augusta.—p. 143.

Medical J. & Record, New York

130: 361-420 (Oct. 2) 1929

Lung Abscess Treated by Bronchoscopy. F. R. Herriman and F. Welker, New York.—p. 361.
Pleurisy. I. B. Bartle, San Luis Obispo, Calif.—p. 364.
Undulant Fever. R. H. Potts, R. D'Aunoy, M. J. Knight and J. L. Beven, New Orleans.—p. 367.
Bilateral Pleural Effusion of Inflammatory Type Following Pneumonia. L. V. Schneider, State Sanatorium, Md.—p. 369.
Acrodynia with Complete Recovery: Case. H. H. Perlman, Philadelphia.—p. 370.
Allergy: Case. F. E. Maisel, New York.—p. 375.
Arterial Hypertension. W. E. Fitch, Bedford Springs, Pa.—p. 376. (C'cn. from page 316.)
Our Future Medical Doctors. G. H. Haller, Cincinnati.—p. 379.
Effects of Digitalis on Nervous System. G. L. Moench, New York.—p. 381.
Treatment of Varicose Veins by Injection of Calcium Chloride. J. F. Bicak, New York.—p. 382.
Practical Applications of Psychiatry in General Hospitals. G. W. Henry, New York.—p. 383.
Nature and Treatment of Neuroses. M. W. Peck, Boston.—p. 386.
Epilepsy a Disease Entity. E. A. Tracy, Boston.—p. 389.
Prognosis and Significant Reactions in Mental Disease. J. F. W. Meagher, New York.—p. 390.
Tumors of Brain Simulating Vascular and Other Degenerative Lesions. I. S. Wechsler and H. Gross, New York.—p. 394.
Brain Surgery. E. R. Carpenter, Dallas, Texas.—p. 397.

Minnesota Medicine, St. Paul

12: 569-658 (Oct.) 1929

Treatment of Diabetes Mellitus. E. P. Joslin, Boston.—p. 569.
Diabetes in Relation to Surgery. G. P. Muller, Philadelphia.—p. 573.
Glycosuria in Life Insurance Examinations. H. W. Cook, Minneapolis.—p. 576.
Diagnosis and Treatment of Carcinoma of Esophagus. H. J. Moersch, Rochester.—p. 582.
Diagnosis and Results in Carcinoma of Stomach. A. E. Olson, Duluth.—p. 587.
Undulant Fever. F. J. Hirschboeck, Duluth.—p. 590.
*Symptoms Due to Gross Hemorrhage into Cystic Adenoma of Thyroid Gland. W. A. Plummer, Rochester.—p. 599.
Spinal Anesthesia. D. H. Bessesen and E. A. Rygh, Minneapolis.—p. 602.
Obstetric Experience of Rural Physician. A. J. Henderson, Kiester.—p. 604.

Symptoms Due to Gross Hemorrhage Into Cystic Adenoma of Thyroid Gland.—Plummer states that, although of infrequent occurrence, hemorrhage of sufficient degree into a cystic adenoma will produce a rather typical clinical picture which is characterized by rapid increase in size associated with pain and tenderness. In three of the four most typical cases he could locate from the records, the patients gave a history of concurrent sore throat, cold, general malaise, and, in two instances, definite fever. It must not be concluded from these limited data: (*a*) that an acute painful enlargement of a cystic adenoma of the thyroid gland due to hemorrhage is usually associated with a constitutional reaction; (*b*) that in cases reported an upper respiratory infection was necessarily present, or if present, as the evidence would indicate, that it was necessarily an etiologic factor in the production of hemorrhage; or (*c*) that even in the absence of definite evidence of an inflammatory reaction in or around the tumors, it could be assumed that the presence of a local infective process was excluded: cultures from the walls of the cysts or the fluid content of the cysts were not made.

Nebraska State Medical Journal, Norfolk

14: 377-416 (Oct.) 1929

Present-Day Conception of Tuberculosis. M. J. Breuer, Omaha.—p. 377.
Practical Considerations of Malnutrition in the Child. H. M. Jahr, Omaha.—p. 384.
Data for Preliminary Report on Study of Maternal Mortality in Nebraska in 1927. F. C. Rothert, Washington, D. C., and E. C. Sage, Omaha.—p. 390.
Cataracts. W. W. Pearson, Des Moines, Iowa.—p. 395.
Early Asymptomatic Neurosyphilis. A. E. Bennett, Omaha and G. N. Nilsson, Bloomfield.—p. 400.
Diagnosis and Treatment of Manic-Depressive Psychosis. E. L. Emrich, Norfolk.—p. 405.

New England J. of Medicine, Boston

201: 611-658 (Sept. 26) 1929

*Icterus Index Studies in Lobar Pneumonia II. N. W. Elton, Detroit.—p. 611.
Acclimatization of White Race in Tropics. R. deC. Ward, Cambridge Mass.—p. 617.

Matricide: Unusual Case. F. D. Jones, Springfield, Mass.—p. 628.
Embolism as Causative Factor in Death. M. M. Canavan, Boston.—p. 630.
Tularemia: Case. P. R. Withington, Milton, Mass.—p. 634.

Icterus Index Studies in Lobar Pneumonia.—In seventy consecutive cases of lobar pneumonia, daily determinations of the icterus index were made by Elton during the acute course of the disease. In the greater number of these cases, quantitative serum bilirubin determinations and van den Bergh tests were also made daily. The etiologic organism was not established bacteriologically, but clinically all except those of influenzal origin were primary lobar pneumonia. Eighteen cases were preceded by influenza. Of these, twelve did not show any latent jaundice, but of the twelve, six had demonstrable pleural exudates. Of the remainder, all except those known to have had pleural exudates on admission, and some in which long-standing exudates were discovered later, showed a latent jaundice, often with icterus index readings in the range of clinical jaundice, though clinical jaundice could not be definitely observed. When plotted on a graph, these icterus index values form curves characteristic of the nature of the pneumonic lesion in the lung. When the pathologic changes are purely intra-alveolar, a rising curve is obtained. A fixation curve and a lag curve may be varieties of this rising curve. In these cases there is no pleural exudate demonstrable by roentgen ray or autopsy other than possibly a fibrinous one. The highest icterus indexes were encountered in cases having true crises. No fatal case had an index above 17. When a pleural exudate of the serofibrinous or seropurulent type developed, enough to be demonstrable by roentgen ray, or was found at necropsy, a precipitous drop of the icterus index invariably signaled its onset, in cases having had a definite initial rise. It is suggested that this latent jaundice, measured precisely by the icterus index, may be taken into consideration as a possible auxiliary mechanism in lobar pneumonia, when the etiologic organism is known to be the pneumococcus, and that the phenomenon of bile solubility, as well as the presence of specific antibodies, may contribute toward producing the dramatic phenomenon of the crisis.

New York State J. of Medicine, New York

29: 659-708 (Oct. 3) 1929

*Cholesterol in Blood of Diabetics Treated at New England Deaconess Hospital. H. M. Hunt, Boston.—p. 659.
*Glycerol Modification of Kahn Test. W. A. Hinton and A. Berk, Boston.—p. 667.
Smallpox Menace. H. O. Smith, Hudson, N. H.—p. 671.
Future of Rural Medicine. J. P. Bowler.—p. 674.
Sterility. G. F. Dwinell, Manchester, N. H.—p. 677.
Address Delivered at Dedication of Roxbury Health Unit. C. F. Wilinsky, Boston.—p. 688.

Cholesterol in Blood of Diabetic Patients.—The values for cholesterol, lecithin and fatty acid found in the plasma of 146 diabetic patients and the cholesterol values in the plasma of forty normal and of 270 diabetic patients treated with insulin are reported by Hunt. Normal values for cholesterol in the blood plasma of forty normal individuals were found to vary from 118 to 272 mg. per hundred cubic centimeters. The average value for the group was 177 mg. Insulin-treated diabetic patients kept on an adequate diet without high fat do not have a concentration of cholesterol in the blood markedly above the normal. This is in marked contrast to the blood sugar, which in diabetic patients treated with insulin shows greater range than before insulin therapy was instituted. Cholesterol still seems to be a more consistent guide to the real condition of the patient than the blood sugar. The same parallel relationship is found to exist between cholesterol, fatty acid and lecithin in insulin-treated diabetes as was found to exist in health and in diabetes in the preinsulin era. Cholesterol values can still be considered an index of variations in blood lipids. Cholesterol values in mild diabetes treated with insulin are lower than cholesterol values in mild diabetes in the Allen era and markedly lower than the values in moderate and severe diabetes in the same period. Treatment with insulin maintains the blood cholesterol in severe diabetes near the normal value. The duration of diabetes has little influence on the value of the blood cholesterol. The age of the patient does not affect the blood cholesterol values. Blood cholesterol values are not found to be high in arteriosclerosis. The group which shows the lowest average blood cholesterol is the one showing greatest arteriosclerosis. The cholesterol values in this series cannot be definitely correlated with any impending or existing arteriosclerotic process. Diets that are rich in eggs do not lead to high cholesterol values in the limited number of cases thus far studied, but in one case the omission of eggs from the diet has been followed by a reduction in the plasma cholesterol. Attention is called to the wide range of cholesterol values which is found in every classification. Further study in an attempt to explain the enormous range of values in normal as well as in pathologic cases is invited.

Glycerin Modification of Kahn Test.—A simple modification is described by Hinton and Berk which, although less sensitive than the Hinton test, has been helpful in the serum diagnosis of syphilis. This modification is easier to read than the original Kahn test, is more sensitive than the original Kahn test, and has not been subject to the variations occasionally encountered with the original Kahn test. The modification consists in the use of a 5 per cent solution of sodium chloride as a diluent in the Kahn reaction and the subsequent addition of 50 per cent glycerin. The amount of the precipitate formed in the presence of syphilitic serums is markedly increased, while no visible precipitate is formed in the presence of nonsyphilitic serums.

New York State J. of Medicine, New York

29: 1177-1241 (Oct. 1) 1929

Sterilization: Indications and Limitaions. S. J. Appelbaum, Rochester.—p. 1177.
Spinal Anesthesia for Abdominal Operations. L. F. Sise, Boston.—p. 1182.
Spontaneous Hematoma of Abdominal Wall: Case. H. N. Kenwell, Buffalo.—p. 1186.
Effect of Administration of Compound Solution of Iodine in Twelve Consecutive Cases of Exophthalmic Goiter. G. M. Goodwin, New York.—p. 1189.
Reducing Diet. A. H. Terry, Jr., New York.—p. 1192.
Sino-Auricular Block Due to Digitalis. L. F. Bishop and L. F. Bishop, Jr., New York.—p. 1195.
Personality Changes in Disease: Tuberculosis. L. J. Bragman, Syracuse.—p. 1196.
*Epinephrine Probe Test in Neurosyphilis. I. J. Arnsson, L. M. Sachs and N. E. Stein, Buffalo.—p. 1199.

Epinephrine Probe Test in Neurosyphilis.—Of 100 patients with neurosyphilis or paresis, with definite clinical and serologic characteristics, ninety-nine showed in the epinephrine probe test the phenomenon of mucographia alba. This term is preferred by Arnsson et al. to dermographia alba, the term used by Muck. Of 105 patients with dementia praecox, four showed mucographia alba limited to one side of the nose. In all four patients the history revealed severe traumas of the skull, and in three of them scars with periosteal swellings were evident. The test proved to be most satisfactory and valuable as a means of rapid orientation before the spinal puncture is performed. The presence of mucographia alba in patients with paresis and patients with neurosyphilis leads the authors to believe that the sympathetic system must also be a seat of a certain pathologic condition.

Pennsylvania Medical Journal, Harrisburg

33: 1-46 (Oct.) 1929

*Heredity in Malignant Disease. J. McFarland, Philadelphia.—p. 6.
Surgery of Gallbladder. J. F. Erdmann, New York.—p. 9.
Etiology of Gallbladder Disease. J. B. Deaver, Philadelphia.—p. 13.
Proper Relation of Practicing Physician and County Medical Society to Public. H. O. Reik, Atlantic City, N. J.—p. 15.
*Eugenic Sterilization. E. A. Whitney, Elwyn.—p. 18.
Malta Fever Originating in Pennsylvania: Case. F. J. Dever and C. E. Royce, Bethlehem.—p. 22.
Acute Laryngotracheobronchitis. F. S. Mainzer, Clearfield.—p. 24.

Heredity in Malignant Disease.—McFarland does not agree with Ewing that cancer is hereditary. He says that the person belonging to a cancer family should know that he may inherit something that may eventuate in cancer and be taught to watch for the first possible indication of its beginning in order that the malignant growth may be removed or destroyed at its first appearance and in its earliest stages. That ought to be an important part of the information which physicians are to lay before the public. Members of cancer families should be warned against marrying into cancer families.

Eugenic Sterilization.—Whitney regards eugenic sterilization of the feebleminded as being a comparatively simple procedure which offers a means of reducing the number of

feebleminded in future generations from 60 to 70 per cent. Aside from preventing reproduction, which is the chief reason for advocating the procedure, it has improved the habits in 70.8 per cent, the nervous system in 48.7 per cent and the mentality in 38.7 per cent in a series of cases reported by him.

Physical Therapeutics, New York

47: 523-586 (Oct.) 1929

Sympathicus in Relation to Physical Therapy. B. B. Grover, Colorado Springs, Colo.—p. 523.
Physical Therapeutics as Specialty of Medical Practice. E. N. Kime, Indianapolis.—p. 538.
Dr. Rosett's Apparatus for Massage. H. F. Wolf, New York.—p. 542.
Physiotherapeutic Considerations in Treatment of Fractures. W. I. Galland, New York.—p. 547.

Public Health Reports, Washington, D. C.

44: 2315-2382 (Sept. 27) 1929

County-Wide Sanitary and Health Survey. M. E. Barnes.—p. 2315.
Method of Preparing and Examining Thick Films for Diagnosis of Malaria. M. A. Barber and W. H. W. Komp.—p. 2330.

South Carolina M. Assn. Journal, Greenville

25: 503-534 (Sept.) 1929

Physiology of Kidney: Clinical Applications. J. Van de Erve, Charleston.—p. 509.
Aplastic Anemia. W. R. Mead, Florence.—p. 517.

Southern M. Journal, Birmingham, Ala.

22: 873-954 (Oct.) 1929

Arthritis Deformans. W. S. Baer, Baltimore.—p. 873.
Radiotherapy of Superficial Malignancies. J. M. Martin, Dallas, Texas.—p. 881.
Endocrine Aspects of Scleroderma: Case with Glandular Dysfunction. E. R. Seale, Houston, Texas.—p. 885.
Compound Fractures Converted Into Simple Fractures. E. B. Henson, Charleston, W. Va.—p. 893.
Serial Pyelo-Ureterography. A. Mattes, New Orleans.—p. 897.
Desirable Medical Student. K. M. Lynch, Charleston, S. C.—p. 904.
What Constitutes a Desirable Medical Student? B. Douglas, Nashville, Tenn.—p. 906.
Cavities in Pulmonary Tuberculosis. A. Blumberg, C. P. Waller and R. L. Russell, Oteen, N. C.—p. 912.
Upper Respiratory Infections. D. L. Smith, Spartanburg, S. C.—p. 918.
Surgical Importance of Anemia. H. H. Fox, Miami, Fla.—p. 920.
Preoperative Precautions in Otolaryngology. P. V. Mikell, Columbia, S. C.—p. 923.
Relation of Laboratory to Standard Milk Control Code. T. W. Kemmerer, Jackson, Miss.—p. 928.
Therapeutic Results in Psoriasis. H. H. Hazen, Washington, D. C.—p. 932.
Seborrheic Dermatitis of Scalp. T. W. Murrell, Richmond, Va.—p. 935.
*Treatment of Eczema in Infants by Milk-Free Replacement Diet. H. M. Robinson, Baltimore.—p. 936.
Newer Knowledge of Heart Disease: III. Interpretation of Cardiac Pain. T. R. Harrison, Nashville, Tenn.—p. 939.

Treatment of Eczema in Infants by a Milk-Free Replacement Diet.—Robinson has prepared a routine diet list for these cases: lamb and beef broth cooked with barley or rice, the broth to be thickened with flour, and croutons used always. Cereals include corn meal, Quaker oats, cream of wheat or farina, rice, barley, hominy. All cereals are to be cooked three hours and put through a sieve. Vegetable purées include tomatoes, spinach, carrots, peas and lima beans (fresh or dried). Grain includes potatoes (white or sweet, baked or mashed); string beans, macaroni (put through a sieve), spaghetti, soy bean flour, wheat bread, and crackers (not sweet). Also coddled white of egg is used. After the age of 8 months, children are given shredded or ground meats: beef, lamb or chicken. The following three articles are mentioned primarily to condemn because almost all children have reacted against these: orange juice, prune juice and apple sauce. Cod liver oil is given, ½ drachm (15 cc.), three times a day, to be increased slowly. The age of the child determines the quantity of feeding.

Southwestern Medicine, Phoenix, Ariz.

13: 379-422 (Sept.) 1929

Problems That Confront Practitioners in New Mexico. F. H. Crail, Las Vegas, N. M.—p. 379.
Artificial Pneumothorax. J. D. Riley, El Paso, Texas.—p. 382.
Cerebrospinal Fever. F. C. Jordan, Phoenix.—p. 387.
Report of Meeting of American College of Physicians in Boston, April 9 to 13, 1929. M. K. Wylder, Albuquerque, N. M.—p. 390.

Texas State J. of Medicine, Fort Worth

25: 321-384 (Sept.) 1929

*Aseptic Technic for Doing Intestinal Anastomosis. J. A. Hardy, El Paso.—p. 332.
*Treatment of Tinea Capitis: Comparison Between Roentgen Ray and Thallium. J. L. Pipkin, San Antonio.—p. 335.
*Congenital Absence of Interventricular Septum in Adult Laborer: Case. C. D. Steinwinder and E. M. McPeak, San Antonio.—p. 341.
Electrocardiogram in Diagnosis and Prognosis. R. M. Barton, Dallas.—p. 344.
Recent Advances in Physiology of Liver and Gallbladder and Relation to Gallbladder Surgery. W. T. Shell, Corsicana.—p. 349.
*Etiology and Treatment of Special Type of Osteitis. P. M. Keating, San Antonio.—p. 353.
Diagnostic Value of Ultraviolet Fluorescence by Wood's Filter. L. Knight, Temple.—p. 356.
Complications, Result of Focal Infection Following Cataract Operations. L. H. Lanier, Texarkana.—p. 358.
Ocular Tuberculosis, Diagnosis and Treatment with Tuberculin. H. L. Hilgartner, Austin.—p. 360.
Focal Infection from Peribronchial and Other Lymphatic Glands. J. W. Torbett, Marlin.—p. 365.
Practical Pediatrics. F. H. Lancaster, Houston.—p. 369.

Aseptic Technic for Doing Intestinal Anastomosis.—Hardy contends that in order to develop a technic whereby a safe, aseptic intestinal anastomosis may be done, the point of attack must be the lumen of the intestine. In pursuance of this thought he has experimented with certain substances injected into the lumen of the intestine for the purpose of rendering it aseptic or at least of inhibiting its bacterial growth. The solutions that proved effective were: 3 per cent aqueous solution of mercurochrome, 2 per cent aqueous solution of mercurochrome and 2 per cent gentian violet (equal parts). Slight differences in the usual technic of intestinal anastomosis were evolved.

Treatment of Tinea Capitis: Roentgen Ray Versus Thallium.—Pipkin relates his experience with thallium and the roentgen ray in the treatment of tinea capitis. Twenty-seven cases were treated with protoxide of thallium acetate. The Buschke technic was followed. Only one case in the group showed a recurrence of the disease. There were no cases in which the hair failed to fall, although in four cases manual epilation had to be resorted to in order to get complete baldness. Only seven patients were entirely free from toxic manifestations. Two patients showed severe toxic symptoms. Thirty patients were treated by complete epilation with roentgen ray according to the MacKee and Remer modification of the Adamson-Keinbach method. The period of baldness lasts from three weeks to two months, this fact being a decided advantage over the thallium method of epilation, as the danger of reinfection of the hair is eliminated. Regrowth starts in from one to three months after epilation, which allows ample time for local treatment. An interesting feature is a change in the quality of the hair. At times there is a change in color or texture. Again, children with straight hair may get a regrowth of curly hair or vice versa. The advantages of each of these methods of epilation are discussed. The use of the thallium method requires a knowledge of the routine of a very simple procedure, necessitating no skill and but an average amount of intelligence and precaution on the part of the administrator. The only preliminary preparation for thallium medication is the urine examination and careful weighing of the child. The method of epilating by means of the roentgen ray requires a skilled, experienced operator who has had the necessary roentgenologic training. Because of this, and also because epilation carries with it a responsibility and is tedious, the operation becomes expensive to patients. Although thallium can be given to very young children with no trouble as regards administration and with apparently the best results, it should not be used for patients past 12 years of age, or after any of the signs of puberty have appeared. There are some cases in which thallium is contraindicated, for example, any case complicated by nephritis or any other organic disease. The roentgen ray cannot be used in patients who have been recently treated (within two or three weeks) with irritative local applications, or who have had recent fractional doses of the roentgen ray. The roentgen ray can be used with impunity in adults. In this series it seemed that underweight children tolerated thallium better than those of normal weight. But in cases in which either method is available, the possible dangers associated with one or the other should be considered in the

final choice of a method to eradicate the disease. Thallium causes falling of the hair by its action on the sympathetic nervous system. It also has some influence on the endocrine system. The drug is eliminated mostly through the kidneys. No one knows what remote effect it will have on the kidneys, endocrine glands, and the sympathetic nervous system. It does not seem feasible to use a drug as toxic, and with such uncertain possibilities as thallium acetate, in the treatment of ringworm of the scalp, if the harmless, established, safe method with the roentgen ray is available.

Congenital Absence of Interventricular Septum in Adult Laborer.—Steinwinder and McPeak cite the case of a man, aged 21, who despite his cardiac anomaly was capable of performing manual labor until the last year or two of his life. Even with such an unusual defect the heart held up for twenty-three years. Not until the patient was stricken with a widespread respiratory infection did his reserve give way completely. The heart was tremendously enlarged, with hypertrophy of the right ventricle apparently predominating. There was marked distention and engorgement of the coronary vessels and congestion of the myocardium. The large vessels at the base were normal except for a transposition of the aorta and pulmonary artery. Except for their unusual size, the atria were normal. The foramen ovale had failed to close completely. There was a complete absence of the interventricular septum. The chordae supporting the inner leaflets of the mitral and tricuspid valves often arose from opposite sides of the common ventricle. That portion of the common chamber corresponding to the right ventricle was many times larger than that corresponding to the left. There was an appreciable narrowing of the mitral and pulmonary orifices. The aortic valve was intact and showed no evidence of disease.

Etiology and Treatment of Special Type of Osteitis.—Keating has recovered a streptococcus from joint structures at arthroplasty or from the synovial fluid in seven or eight cases of arthritis, and from the stool in 100 per cent of the 250-odd cases of arthritis examined. Approximately 800 stools were examined of patients who had no arthritic symptoms, and in 12 per cent a streptococcus not usually present in the intestinal tract was found. Nine per cent of these patients were found to have an acute or subacute infection in the nose or throat, leaving 3 per cent of nonarthritic patients who had no other demonstrable foci from whose intestinal tracts a streptococcus differing from those usually present was demonstrated. In about 2 per cent of all stools examined, a monilia or a saccharomyces infection was found. A guinea-pig inoculated with a streptococcus recovered from a joint developed a severe polyarthritis. A streptococcus was subsequently recovered from its feces, which previously had been negative. A monilia has also been recovered from the stool of guinea-pigs after inoculation for the purpose of preparing a monilia vaccine. Keating has also not infrequently recovered streptococci from the blood stream of patients exhibiting no febrile reaction. He is of the opinion that, at least in some cases, streptococci in the stool represent an eliminative process rather than a massive focus of infection in the intestinal tract, and that this is true of other forms of infections as well. This may account for the fact that streptococci and fungi cannot be cultivated from every specimen of stool, but seem to come in showers exactly as is the case in blood cultures. The blood serum in three cases showed agglutinins to the specific monilia. The blood calcium was low in six cases, and showed a decided rise after treatment in two patients reexamined. Treatment with iodides, roentgen ray and vaccine has given remarkable clinical results in all cases except the arthritic cases, and these show some improvement. Treatment by monilia vaccine seems to be giving good results. After treatment, the monilia and the streptococcus both disappeared from the joint fluid and usually disappear from the stool. After treatment, roentgen examination disclosed a marked regeneration of bone in the three patients who were reexamined.

United States Naval M. Bull., Washington, D. C.

27: 551-823 (July-Oct.) 1929

*Pathology in Tropics. R. M. Choisser.—p. 551.
Public Health in Haiti. K. C. Melhorn.—p. 568.
Specialization in Navy. H. W. Smith.—p. 573.
Clinical Analysis of 100 Operations on Gallbladder and Biliary Tract. C. M. Shaar.—p. 596.
Isolation Type of Personality. K. A. Menninger.—p. 609.
Hydrogen Ion Concentration. C. Schaffer.—p. 621.
Chancroids. J. E. Potter and F. H. Redewill.—p. 635.
Control and Treatment of Epidermophytosis. D. S. O'Connor.—p. 641.
Medical Social Problems of Follow-Up as Presented by Service Groups. F. McClaughry.—p. 644.
Laboratory Consultant. G. B. Dowling.—p. 654.
Coccidioidal Granuloma: Case. H. E. Ragle.—p. 657.
Japanese Schistosomiasis: Case. J. Harper.—p. 661.
Rhinolith. F. E. Locy.—p. 668.
Eradication of Bedbugs. E. A. Sharp.—p. 669.
Simple and Easily Made Traction Splint for Fractures of Humerus. L. H. Williams.—p. 671.
Complete Unilateral Duplication of Ureter and Pelvis. F. R. Moore.—p. 672.
Removal of Tattoo Marks. J. H. Korb.—p. 674.
Use of the Tonsillectomy Snare in Eye Enucleation. E. C. Ebert.—p. 677.
Syphilis: Recurrence or Reinfection? C. S. Stephenson and J. Love.—p. 677.
Systematic Arrangement of Dental Instruments. C. V. Rault.—p. 680.
Personality of Nurse. K. C. Melhorn.—p. 687.

Diseases in the Tropics.—Choisser's study is based on a series of 700 consecutive necropsies performed at the Haitian General Hospital, Port au Prince, from June, 1926, to January, 1928. The chief cause of death among the Haitians was found to be pulmonary tuberculosis, which averaged 26 per cent of the total. The gastro-intestinal system was responsible for death in thirty-three, or 4.7 per cent of the cases. Of this number, ten were due to typhoid in 1927 and three in 1928. No deaths resulted from bacillary dysentery or intestinal protozoal infestations, although two deaths were attributed to a heavy infestation with *Strongyloides stercoralis*. Cirrhosis of the liver is not especially common in the Haitian; ten cases were recorded in all, with only three of these being of the typical atrophic type. Gallstones and renal calculi are also rare. He found five cases of the former and only one of the latter in the entire series, and these did not produce symptoms during life. The size of the spleens in Haitians is not above normal. The average weight was 160 Gm., exclusive of four extra large pathologic ones and all those in children under 5 years of age. Acute nephritis is rare, although chronic nephritis is quite common. There were sixty-one, or 8.7 per cent, of deaths from this cause. Endocarditis, both of the acute and of the chronic type, is rare in Haitians. Two cases of acute mitral diseases were found in terminal acute infections, and five cases of chronic endocarditis. Four of the latter were of the mitral valve and one of the aortic leaflets. Death from malaria is not uncommon in Haiti. There were six deaths from this condition, all of which were caused by the malignant tertian parasite. The parasites in each instance were demonstrated in the brain, bone marrow and spleen pulp by direct smear. Malignant disease was found to be just as common in Haitians as in other races in the temperate zones, and the cell type of the cancers differed in no way from those common to Caucasians. Carcinoma was seven times more common than malignant connective tissue tumors. Regardless of the apparent degree of malignancy of the various cell types of cancers, distant metastases were not common. Five cases of basal cell tumors and three of nonpigmented melanomas were found in pure-blooded Haitians. The former were on the face and scalp and the latter on the heel. The pathologic changes of late untreated yaws so closely resemble those resulting from tertiary syphilis that it was impossible to differentiate the two without a clinical history. The first pathologic evidence of yaws infection in the internal organs was found in the aorta. These early lesions manifest themselves by irregular linear scars and atheromatous plaques, which begin about 5 mm. above the aortic cusps. The aortic valves themselves do not appear to be universally involved in tertiary yaws or in their late cases of so-called trepanematosis. Late untreated yaws predisposes to aortic aneurysm, particularly of the arch. These cause much pain from pressure and tend toward early rupture. Gummas of the liver and brain occasionally occur in tertiary yaws infection. Spontaneous internal cerebral hemorrhage in the middle aged is not uncommon in late yaws. These observations indicate that sudden death occurring in young adults, with old yaws infection, should prompt a prenecropsy diagnosis of either internal cerebral hemorrhage or a ruptured aortic aneurysm.

Virginia Medical Monthly, Richmond

56: 429-498 (Oct.) 1929

Surgical Consideration of Dyspepsias Caused by Chronic Appendicitis and Chronic Cholecystitis. E. Horgan and J. Horgan, Washington, D. C.—p. 429.
Osteitis Deformans (Paget's Disease): Case. G. W. Brown and P. G. Hamlin, Williamsburg.—p. 432.
Potter's Version. R. P. Kelly, Lynchburg.—p. 436.
Bronchial Obstruction. F. D. Woodward, University.—p. 439.
Diagnostic Problems Peculiar to Pediatrics: Child-Parent Psychology: Cases. C. B. Conklin, Washington, D. C.—p. 443.
Bronchogram as Aid in Differential Diagnosis of Pulmonary Lesions. E. E. Watson and C. Robertson, Salem.—p. 447.
Regenerative Hyperplasia in Exophthalmic Goiter: Condition Simulating Carcinoma. A. C. Broders, Rochester, Minn.—p. 453.
Dystocia. M. P. Rucker, Richmond.—p. 456.
Partial Hydatid Degeneration of Placenta Late in Pregnancy: Case. F. Helvestine, Jr., Roanoke.—p. 459.
Congenital Lack of Development of Right Hand: Case. D. P. Penhallow, Washington, D. C.—p. 461.
Infectious Diarrhea. S. Wilson, Lynchburg.—p. 464.
Spontaneous Fecal Fistula Through Anterior Abdominal Wall: Case. W. B. Blanton and J. C. White, Richmond.—p. 467.
Social Aspect of Mental Abnormalities and Problem of Eugenics. A. Gordon, Philadelphia.—p. 469.
*Unusual Case of Giant Meckel's Diverticulum. J. A. Cahill, Jr., Washington, D. C.—p. 474.
Fascia to Fascia Apposition in Herniorrhaphies. P. Jacobson, Petersburg.—p. 477.
Ethylene: New Anesthetic. B. Wilson, Richmond.—p. 480.

Giant Meckel's Diverticulum.—Cahill reports the case of a boy, aged 13, who had had two attacks of what was believed to be appendicitis, recovering from each. Suddenly he was seized with a sharp pain in the lower part of the abdomen. This was accompanied by nausea and vomiting. A diagnosis of acute appendicitis was made and immediate operation was performed under nitrous oxide and ether anesthesia. When the peritoneal cavity was opened, a large amount of thin, clear, straw-colored fluid was seen to escape. The appendix was retrocecal, adherent and markedly inflamed. It showed definite evidence of disease. In exploration of the pelvic cavity a mass was found and when this mass was delivered into the wound a definite obstruction was encountered. This obstruction was caused by a large Meckel's diverticulum. The diverticulum itself was about the size of a large orange of a club shape, and tapering to a broad pedicle which fused with the ileum about 15 inches from the ileocecal valve. The diverticulum had three titlike projections or protuberances. From the center or middle projection was attached a thick, cordlike band which was about 18 inches in length and was attached to the small intestine higher up. There was no lumen in this band but there evidently had been one in fetal life. This band made a hammock or sling through which the intestine became tangled. The ileum itself was incarcerated and almost gangrenous. There were many mesenteric glands enlarged. The operation consisted of the appendectomy, a resection of Meckel's diverticulum, and a release of the intestinal obstruction. The patient made a perfect recovery.

West Virginia Medical Journal, Charleston

25: 577-640 (Oct.) 1929

Biliary Tract Infection. J. B. Deaver, Philadelphia.—p. 577.
Private Practice of Preventive Medicine. H. Emerson, New York.—p. 584.
Some Medical Problems. C. H. Hall, Elkins.—p. 595.
Oxygen Therapy. M. A. Blankenhorn, Cleveland.—p. 597.
Acute Abdominal Pain. W. H. Wallingford, Princeton.—p. 603.
Prenatal Care. W. S. Smith, Philippi.—p. 608.
Vincent's Angina. S. S. Hall and H. V. Thomas, Fairmont.—p. 612.
Spina Bifida. B. L. Liggett, Mill Creek.—p. 614.

Wisconsin Medical Journal, Madison

28: 449-508 (Oct.) 1929

Preventive Medicine. F. J. Gaenslen, Milwaukee.—p. 449.
Form of Disease; Clinical Picture and Individual. K. W. Doege, Marshfield.—p. 453.
Medical and Dental Aspects of Focal Infection. J. Y. Malone, Eau Claire.—p. 458.
Injection Treatment of Varicose Veins. R. M. Carter, Green Bay.—p. 461.
Tetratoid Tumor of Testicle: Report of Case. E. A. Pohle, Madison.—p. 466.
Multiple Perforations of Peptic Ulcers: Case. G. E. Skemp and A. A. Skemp, La Crosse.—p. 469.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British J. Bio-Physics, London

2: 1-15 (Oct.) 1929

Neurasthenia: Cause, Treatment and Cure. F. Brook.—p. 3.
Light Treatment of Lupus. J. Wilson.—p. 6.
Treatment of Infected Pelvic Organs by Diathermy. C. A. Robinson.—p. 7.
Mixed Radiations. E. J. Deck.—p. 10.
High Frequency in Therapeutics: III. General Therapeutic Action of High-Frequency Currents. E. Browning.—p. 11.
Therapeutics of Mineral Waters and External Application. G. L. K. Pringle.—p. 13.

British Medical Journal, London

2: 567-604 (Sept. 28) 1929

*Relation of Malignant Disease to Benign Tumors of Intestinal Tract. M. J. Stewart.—p. 567.
Diverticulitis. E. I. Spriggs.—p. 569.
Diverticulitis of Sigmoid. W. J. Mayo.—p. 574.
Sanocrysin Treatment of Pulmonary Tuberculosis. B. R. Clarke.—p. 576.
Asbestos Dust and Curious Bodies Found in Pulmonary Asbestosis. W. E. Cooke.—p. 578.
Clinical Aspects of Pulmonary Asbestosis. A. C. Haddow.—p. 580.
Method of Examining Sputum for Asbestosis Bodies. M. J. Stewart.—p. 581.
Foreign Body in Larynx. H. Downer.—p. 581.
Subarachnoid Hemorrhage Probably Due to Rheumatic Infection. F. A. Sharpe.—p. 582.

Relation of Malignant Disease to Benign Tumors of Intestinal Tract.—Stewart asserts that an important and intimate relationship exists, both in the stomach and in the rectum and colon, between simple adenomatous polypi and carcinoma. The evidence goes to show that an actual malignant metamorphosis takes place in the epithelium of one or more of the polyps, although the ultimate full development of a malignant condition is in most cases confined to a single focus. As a local factor in the etiology of cancer, intestinal polypi occupy a most important position, much more so than their gastric congeners. In cases in which only a single polypus is present, simple removal of the tumor with its pedicle and base may be followed by cure, even after definite carcinomatous change has occurred. In cases of generalized polyposis, only extensive operative procedures with a high mortality—gastrectomy, total or partial, or colectomy—are likely to be successful in preventing the onset or checking the spread of malignancy. There is a certain amount of evidence to show that sarcomatous metamorphosis may occasionally occur in simple leiomyomatous tumors of the alimentary tract, just as in uterine fibroids. There is no evidence that the simple heterotopic tumors of the stomach and intestine—adenomyoma, pancreatic heterotopia, brunnerian adenoma—are especially liable to malignant change. The so-called carcinoid tumors of the appendix and small intestine rarely undergo metastasis to lymph glands or liver. This, when it occurs, is part of the natural history of these tumors (cf. rodent ulcer of the skin), and does not indicate anything in the nature of a new or superimposed malignant nature.

Journal of Path. & Bacteriology, Edinburgh

32: 717-855 (Oct.) 1929

Exotoxins of Staphylococcus Pyogenes-Aureus. F. M. Burnet.—p. 717.
*Oligodendrogliomas of Brain. P. Bailey and P. C. Bucy.—p. 735.
Distribution of Colloidal Lead in Tissues After Intravenous Injection. W. J. Dilling and E. F. Haworth.—p. 753.
New Fixative (Mercuric Acetate) for Mitochondria. J. Gough and J. D. Fulton.—p. 765.
Antigenicity of Crystalline Egg Albumin. R. C. Lancefield and J. H. Quastel.—p. 771.
*Experiments to Determine Whether There is a Filtrable Form of Tubercle Bacillus. S. R. Gloyne, R. E. Glover and A. S. Griffith.—p. 775.
Periarteritis Nodosa: Case. J. Gray.—p. 787.
Traumatic (False) Aneurysm of Aorta. T. Shennan.—p. 795.
Etiology and Pathology of Primary Lung Tumors. N. H. Schuster.—p. 799.
Types of Tubercle Bacilli in Human Tuberculosis. A. S. Griffith.—p. 813.
General Melanomatosis Arising from Pigmented Nevus: Case. R. O. Girdwood.—p. 841.
Anterior Sacral Meningocele. A. M. Drennan.—p. 843.

Oligodendrogliomas of Brain.—In four brain tumors, the presence of oligodendroglia was proved definitely by Bailey and Bucy. The oligodendroglioma is predominantly a tumor of the

cerebral hemispheres of adults, although the authors have seen one possible case at the age of 5. There is no marked predominance in either sex. It is evident also that these are slowly growing tumors, the average being 57.5 months of symptoms before the operation and the postoperative survival being 39.2 + months. The average total survival is 96.7 + months. The microscopic observations agree with the clinical course in that there are few mitotic figures. The tumors are almost invariably calcified. The prognosis in these cases is relatively good.

Experiments to Determine Whether There Is a Filtrable Form of Tubercle Bacillus.—Experiments made by Gloyne et al. failed to demonstrate the existence of a filtrable form of the tubercle bacillus.

Lancet, London

2: 643-694 (Sept. 28) 1929

*Nervous and Mental Aspects of Pernicious Anemia. D. McAlpine.—p. 643.
*Harmine in Treatment of Chronic Epidemic Encephalitis. T. R. Hill and C. Worster-Drought.—p. 647.
Actinotherapy. A. Eidinow.—p. 649.
*Importance of Liver in Chemotherapy. L. Cunningham and M. M. Datnow.—p. 652.
Congenital Ectodermal Defect. A. W. Falconer.—p. 656.
Prognosis in Malignant Melanoma: Forty Consecutive Cases. H. H. Gleave.—p. 658.
Glycerin in Cesarean Section. M. Salmond.—p. 659.

Nervous and Mental Aspects of Pernicious Anemia.—On the basis of a study of twenty-four cases, McAlpine is convinced that the neurotoxin associated with pernicious anemia may attack all parts of the nervous system, cerebrum, spinal cord and peripheral nerves, although not necessarily simultaneously. In subacute combined degeneration of the cord the peripheral nerves are generally affected, especially in the so-called tabetic type of the disease. Pernicious anemia is a common cause of peripheral neuritis in persons over the age of 35. If the tongue is affected, the diagnosis becomes more probable. Mental changes occur not uncommonly in pernicious anemia. They range from states of depression, accompanied by loss of mental energy, to definite psychoses. They, like the nervous symptoms, may precede the characteristic changes in the blood by many months. More frequent examination of the gastric contents and of the blood, especially for the presence of megalocytosis, is called for in primary neuroses, and psychoses occurring after the age of 35, in view of the favorable results that may follow adequate treatment, instituted at an early stage. The effects of liver treatment on the neurologic symptoms are variable. In cases showing a marked degree of anemia the improvement may be largely attributed to the favorable effect of such treatment on the blood and general condition. When an extensor response exists, this improvement is slight; the progress of the disease may for a time be arrested, but not uncommonly it advances despite adequate treatment. The type of case with abolition of deep reflexes, in which it is suggested that the peripheral sensory neuron largely bears the brunt of the disease, at least in the early stages, is naturally the most favorable. The well established rules regarding the eradication of dental sepsis and the administration of hydrochloric acid still maintain their importance.

Harmine in Treatment of Chronic Epidemic Encephalitis.—Harmine is an alkaloid obtained from the plant *Perganum harmala*. It is said to be identical in structure with banisterine, an alkaloid of *Banisteria caapi*. Hill and Worster-Drought studied the drug clinically. Harmine in doses up to 0.04 Gm. given hypodermically has no perceptible objective or subjective effect in ameliorating any of the symptoms presented in the parkinsonian syndrome and is of no value in the treatment of this condition. When given in these doses, harmine produces toxic symptoms of dizziness, headache, nausea and vomiting in a certain proportion of cases. These toxic symptoms are probably due to the action of harmine on the brain stem; e. g., stimulation of the vestibular nuclei and vomiting center. In one reported case and in one of the authors' cases, the symptoms of severe chronic tachypnea in a patient free from parkinsonism were partially relieved.

Importance of Liver in Chemotherapy.—In the observation of the toxic effects of the injection of colloidal lead, Cunningham and Datnow have reached the conclusion that a careful study of the existing injury to the liver in the course of treatment, so far as this is possible, is of importance in the determination of the extent and interval of dosage. A careful examination of the liver function is of great importance also in the initial selection of cases, for one cannot hope to treat a case successfully with lead when the liver function is even moderately impaired.

2: 695-750 (Oct. 5) 1929

Arrogance and Ignorance in Medicine. E. F. Buzzard.—p. 695.
*Experimental Production of Malignant Tumors in Fowl. A. M. Begg and W. Cramer.—p. 697.
*Ultimate Prognosis in Cases of Eclampsia and Albuminuria of Pregnancy. J. C. G. Sym.—p. 698.
*Subacute Meningococcal Septicemia. C. L. Stote.—p. 701.
*Therapeutic Value of Irradiated Milk in Treatment of Rickets. C. Watson and T. Y. Finlay.—p. 704.
Adenocarcinoma of Bronchus: Case. L. S. T. Burrell.—p. 708.
*Cicatricial Stenosis of Esophagus: Case. K. Heritage.—p. 708.
Chronic Parasitic Funiculitis in Egypt. M. F. Sorour.—p. 708.

Experimental Production of Malignant Tumors in Fowl.—Begg and Cramer assert that the alleged experimental transformation of normal cells of the fowl into malignant cells by simple chemical substances is based on isolated experiments, in which the tumors produced always had the histologic appearances and biologic features of Rous tumor 1. In view of this peculiar feature and the failure to confirm these results, they must be ascribed to an experimental error similar to that responsible for the positive results obtained in an experiment described in this paper. This experiment emphasizes the necessity for all laboratories in which the Rous tumor 1 is being propagated of subjecting all apparatus used in experiments on fowls to a process of sterilization which will insure the destruction of the "agent." Unless this precaution is observed, the inoculation of material which in itself is inactive may by contamination produce a typical Rous tumor 1. The experiment described has been repeated five times with the precaution just mentioned being observed. The results were uniformly negative.

Ultimate Prognosis in Cases of Eclampsia and Albuminuria of Pregnancy.—Analysis made by Sym of the clinical histories of seventy-four eclamptic women has shown that about a fourth of the pregnancies that occur after eclampsia are complicated by some degree of toxemia. Almost half the pregnancies that occur after albuminuria are complicated by some degree of toxemia. The earlier albuminuria begins in pregnancy, and the longer it persists the more likely is it to cause renal injury and to recur in a future pregnancy. There is recurrence of toxemia in the absence of any detectable trace of renal impairment. If traces of renal injury are absent, and if patients do not become pregnant, they remain in good health.

Clinical Picture Produced by Subacute Meningococcal Septicemia.—Stote reports two cases and reviews the literature. Subacute meningococcal septicemia, when uncomplicated by metastases, gives a clinical picture that is peculiar to the condition, forming a definite clinical syndrome. It is characterized by: (*a*) remittent fever, lasting from a few weeks to several months; (*b*) a rash, consisting of small papules which come out in crops, especially on the limbs and face; (*c*) joint pains, moving from joint to joint, appearing with a rise of temperature and disappearing during defervescence; (*d*) absence of physical signs; (*e*) relatively extremely good general condition of the patient; (*f*) an excellent prognosis. Meningeal infection need not occur during a meningococcal septicemia of this type.

Therapeutic Value of Irradiated Milk in Treatment of Rickets.—The claims of numerous German writers concerning the value of irradiated milk in the prevention and cure of rickets are confirmed by Watson and Finlay. Irradiated milk should not be regarded as a complete substitute for good fresh untreated milk. In rickets, between 2 and 5 years of age, excellent results have followed its use when the milk has been used in strengths varying from 1 part irradiated to 2 parts unirradiated, up to equal parts of the two preparations. The cure of the disease is established more quickly, effectively and economically by the use of irradiated milk than by various irradiated commercial preparations. There are indications that irradiated milk may prove of great value in the treatment of certain disorders other than rickets—notably disorders incidental to pregnancy and lactation, the climacteric, malnutrition, injuries and surgical diseases of bone, and certain forms of tuberculosis.

Cicatricial Stenosis of Esophagus.—The case cited by Heritage is unusual in view of the long period (thirty-seven years) between swallowing a caustic in infancy—an event forgotten by the patient—and the onset of definite dysphagia two years ago. The complete nature of the obstruction when first seen is also noteworthy. Treatment by gradual dilation under direct vision through an esophagoscope passed under local, or without, anesthesia, was effective in overcoming the obstruction.

Archives des Maladies de l'App. Digestif, etc., Paris

19: 677-804 (June) 1929

Idiopathic Dilatation of Esophagus. S. Sterling-Okuniewski.—p. 677.
*Diagnosis of Intragastric Tumors: Pneumogastrography. A. Lamas and Varéla Fuentes.—p. 684.
Rôle of Infection in Hemorrhages from Gastric Ulcers. G. Jeannency. —p. 691.
*Treatment of Catarrhal Jaundice. I. Pavel, C. Bratesco and G. Negresco. —p. 696.
Reconstruction of Common Bile Duct. J. de Harven.—p. 710.
Acetic Aldehyde and Lactic Acid in Urine in Diabetes Mellitus and in Vitamin Deficiency. O. Kauffmann-Cosla and J. Roche.—p. 718.

Diagnosis of Intragastric Tumors: Pneumogastrography.—Lamas and Varéla Fuentes report two cases of polyposis of the stomach in which a diagnosis could not be made on the basis of the roentgen examination as usually performed following the ingestion of a bismuth meal. In the first instance an operation shortly after the roentgen examination revealed multiple polypi in the stomach; microscopic examination of the polypi showed cancerous degeneration. In the second instance the results of the roentgen examination as usually performed following the ingestion of a bismuth meal indicated no changes in the shape of the body of the stomach, whose borders were smooth and supple; the peristaltic waves passed along their entire length. The pyloric antrum was greatly elongated and its caliber was decreased; manual displacement of the antrum was difficult. The stomach filled well and was without defects. In view of the clinical symptoms the authors decided to make a more thorough examination of the stomach. They had the patient swallow a duodenal tube until its lower end had reached the stomach. Air was then carefully injected through the tube under roentgen control. A roentgenogram was made at once before the air could escape through the esophagus or the duodenum. In this roentgenogram the following changes were noted: Within the stomach two tumor masses were clearly visible. They had the appearance of polyps, projecting into the lumen of the stomach; their borders were smooth and their bases were broad. The wall of the stomach in the zone of implantation of the polyps appeared clearly outlined and was well differentiated from the base of the tumor, and of normal thickness. From their experience in these cases the authors conclude that, in patients in whom one suspects the presence of a gastric neoplasm but in whom the results of the usual roentgen examination are negative or inconclusive, pneumogastrographic examination should be tried.

Treatment of Catarrhal Jaundice.—On the basis of the fact (Roger) that there is a direct relation between the glycogen content of the liver cell and its antitoxic power, Pavel et al. recommend the administration of insulin and sugar in the treatment of catarrhal jaundice. They report good results with this form of treatment combined with medical drainage of the biliary tract.

Gynécologie et Obstétrique, Paris

19: 417-508 (June) 1929

*Absolutely Extraperitoneal High Cesarean Section. B. J. Kouwer.—p. 418.
*Temporary Sterilization of Women. Turenne.—p. 442.
Torsion of Pyosalpinx of Left Uterine Tube and Simultaneous Right-Sided Tubal Abortion. Le Balle.—p. 449.
Abdominal Pregnancy with Tumor of Greater Omentum. P. Rullé.—p. 455.
Foreign Bodies in Urogenital Tract in Women. R. Tcherlok.—p. 465.

Absolutely Extraperitoneal High Cesarean Section.—In some cases of pregnancy in which both classic and cervical cesarean section would be too dangerous because of an infection of the uterus and in which embryotomy or Porro's operation would seem to be indicated, Kouwer recommends his method of absolutely extraperitoneal cesarean section. He emphasizes the fact, however, that his method is not indicated in all cases in which infection is present or suspected. In 216 cesarean sections, in 140 of which infection was present or suspected, he used his method only nine times. The method is a modification of Lestocquoy's method of cesarean section. The author makes a long median incision in the abdominal wall in such a manner that the umbilicus is located between its upper third and its lower two thirds. The gravid uterus is not delivered through the incision. Instead it is sutured to the incision by means of a double layer of continuous sutures in such a manner that after the suture has been completed a part of the wall of the uterus presents itself through the opening in the form of an oval 18 cm. long and 12 cm. wide. The first suture includes the parietal peritoneum at a distance of from 2 to 2.5 cm. from the free edge of the wound and the second at a distance of from 1 to 1.5 cm. The suture in two layers is made with silk and provides an absolute isolation of the abdominal cavity. Only ten minutes is required to perform it. The uterus is then incised, the infant and the placenta are extracted, the uterine cavity is wiped out and the incision in the uterus is closed. According to the condition found the abdominal wall is left open (tamponed with sterile gauze) or is partially sutured. After the complete involution of the uterus a second operation is necessary in all cases in order to suppress the artificial fixation of the uterus and to correct, if necessary, the scar in the uterus.

Temporary Sterilization of Women.—Turenne discusses the various methods used for temporary sterilization of women and describes his operation for this condition. In fourteen cases he obtained good results by burying about 1 cm. of the fimbriated end of the uterine tubes in the broad ligament.

Journal de Chirurgie, Paris

34: 1-144 (July) 1929

*Treatment of Torsion of Knee Joint Accompanied by Bone Lesions. R. Leriche and J. de Girardier.—p. 1.
Fractures of Vertebrae Without Spinal Deformity and Without Lesions of Spinal Cord. M. P. Huet.—p. 15.
*Diagnosis and Surgical Treatment of Mobile Cecum. G. Pieri.—p. 33.

Treatment of Torsion of Knee Joint Accompanied by Bone Lesions.—Leriche and de Girardier report five cases of torsion of the knee joint accompanied by bone lesions in which they performed arthrotomy. On the basis of the results obtained in these cases they contend that immediate arthrotomy should be considered as the treatment of choice in severe torsions of the knee joint accompanied by bone lesions which can be demonstrated roentgenologically or which are indicated by the size and rapid reappearance of a hemarthrosis. By the use of this form of treatment considerable time is saved, a perfect functional result is assured and late sequelae are avoided. The authors emphasize the fact, however, that arthrotomy in torsions of the knee joint is a treatment of exception and that ordinary forms of hemarthrosis should be treated in the customary manner.

Diagnosis and Treatment of Mobile Cecum.—Pieri diagnoses mobile cecum on the basis of the results of roentgen examination, pain on palpation in the right iliac fossa and cecal stasis. The subjective symptoms consist of a painful sensation of heaviness in the right lower quadrant, which is usually increased when the patient stands and is decreased when he lies down; in some of the cases the pain increases several hours after a meal (coinciding with the filling of the cecum). Occasionally this chronic condition is accompanied by attacks of acute appendicitis because the cecal stasis predisposes to inflammatory changes in the mucosa of the appendix. In the treatment of fourteen patients with mobile cecum, the author obtained good results by means of resection of the cecum and end-to-side anastomosis between the lower end of the ascending colon and the sigmoid. The article contains eight illustrations showing how the operation is performed.

Journal d'Urologie Médicale et Chirurgicale, Paris

28: 1-112 (July) 1929

*Surgical Treatment of Retention of Urine. V. Richer.—p. 5.
*Vaccine Treatment of Acute Gonorrhea. P. Barbellion.—p. 8.
Periureteral Sympathectomy. L. Caporale.—p. 28.

Surgical Treatment of Certain Forms of Retention of Urine.—Richer states that there are certain forms of retention of urine in which it is difficult to demonstrate the cause. In all

these cases local lesions are absent and a disturbance in the innervation of the musculature of the bladder seems to be present; this disturbance may be either in the spinal cord or the hypogastric plexuses or in their afferent or efferent branches. The diagnosis of a disturbance in the innervation of the musculature of the bladder may be confirmed by the pilocarpine test (a hypodermic injection of 1 cc. of a 1 per cent solution of pilocarpine nitrate causes violent contractions of the bladder for a short time). The diagnosis is likewise confirmed if the same disturbance is present in the colon (retention, atony and dilatation), adding to the distention of the bladder a syndrome of megacolon. The author describes a case of this condition which he designated as colovesical atony. A woman, aged 50, suddenly developed a complete retention of urine. A physician passed a catheter and withdrew 2 liters of urine. Micturition was not reestablished and catheterization was performed regularly for one month. The patient then came under the observation of the author. He noted that in addition to the vesical phenomena there was marked dilatation of the colon; clinical and roentgen examination failed to reveal a local lesion. There were no spinal cord signs or motor or sensory disturbances which would make one think of tabes, Pott's disease or a tumor of the spinal cord. After the fact had been demonstrated that micturition could not be reestablished by a simple local treatment the pilocarpine test was performed as follows: Three hundred and fifty cubic centimeters of fluid was injected into the bladder; the patient voided 50 cc. of fluid, leaving a residue of 300 cc. An additional 50 cc. of fluid was injected into the bladder and 1 cc. of a 1 per cent solution of pilocarpine nitrate was injected hypodermically; intense contractions of the bladder were soon noted (together with diarrhea) and the patient voided 250 cc. of fluid, leaving a residue of 100 cc. Several days later the pilocarpine test was repeated with the same results. The author then performed a bilateral section of the two hypogastric nerves just before their entrance into the hypogastric plexuses. After the operation the patient micturated several times daily. Three months later a residue of only 60 cc. was found. On the basis of the good results obtained in this case the author recommends bilateral section of the hypogastric nerves in urinary incontinence caused by disturbances in the innervation of the musculature of the bladder.

Vaccine Treatment of Acute Gonorrhea.—According to Barbellion vaccine treatment is completely inefficacious in about 90 per cent of all cases of acute gonorrhea.

Paris Médical

2: 173-184 (Aug. 31) 1929

Hirsch's Interferometric Method of Serum Diagnosis. A. F. X. Henry. —p. 173.
*Erysipelas: Experimental Study of Biologic Treatment. V. de Lavergne, P. Florentin and H. Gousset.—p. 180.

Erysipelas: Experimental Study of Biologic Treatment.—De Lavergne et al. report that in their experiments on rabbits, erysipelas proved obdurate to antistreptococcus vaccine or serum therapy. Neither the local application of ointments containing antistreptococcus vaccine nor the subcutaneous injection of vaccine or serum into patients and animals had any influence on the duration or severity of the disease.

Presse Médicale, Paris

37: 1133-1148 (Aug. 31) 1929

Acute Appendicitis: Diagnosis and Treatment. G. Métivet.—p. 1133.
Pott's Paraplegia: Treatment. R. Massart and R. Ducroquet.—p. 1134.
*Experimental Production of Nodules of Gandy-Gamna. G. M. Fasiani and G. Oselladore.—p. 1136.
*Chronic Malignant Malaria: Treatment by Sodium Cacodylate. R. Ullmann-Apostolon and G. Apostolon.—p. 1137.

Experimental Production of Nodules of Gandy-Gamna.—Fasiani and Oselladore succeeded in producing siderous nodules in two of twenty cats by the injection of alcohol into the spleen together with ligation of the hilum vessels. Death ensued one month later in one animal and two months after the operation in the other. In both, the spleen was slightly decreased in size and melanotic, and at the pole of injection a small irregular yellow focus was evident. The results of the microscopic and microchemical examinations were similar in both instances and conform to the description given by Gandy and Gamna of the nodules observed in some cases of chronic hypertrophy of the spleen. These authors believe them to constitute foci of degeneration *sui generis* impregnated with iron salts. Fasiani and Oselladore state that if their results are confirmed they will constitute the best proof in favor of the interpretation that Gamna gave to the nodules which bear his name.

Chronic Malignant Malaria: Treatment by Sodium Cacodylate.—Ullmann-Apostolon and Apostolon present the results of their treatment of malaria in hundreds of cases seen during ten years in Macedonia, where the most malignant form of the disease is prevalent. They give daily intravenous injections of extremely large doses of sodium cacodylate (from 1 to 2 Gm.) associated with a subcutaneous injection of strychnine sulphate (2 mg.); during the first ten days of the treatment they also give quinine sulphate (from 1.5 to 2 Gm.) daily by mouth. The only disturbances caused by this medication were a slight diarrhea in from 10 to 15 per cent of the patients. In from 3 to 5 per cent of the patients after five or six injections, an eruption with enlargement of the parotid glands and a rise in temperature were noted. The authors consider this medication preferable to splenectomy. Not only the attack but also the entire course of the disease was modified.

Revue Médicale de la Suisse Romande, Lausanne

49: 441-504 (July 25) 1929

*Treatment of Pneumonia and Bronchitis with Ethylhydrocupreine. M. Ehinger.—p. 441.
*Vaccination Against Diphtheria. H. Audeoud.—p. 455.

Treatment of Pneumonia and Bronchitis with Ethylhydrocupreine.—From the results he obtained with ethylhydrocupreine in the treatment of twenty-five patients with acute diseases of the lungs, Ehinger concludes that this substance is the drug of choice in the treatment of fibrinous pneumococcal pneumonia. Its use is indicated also in bronchopneumonia and pneumococcal bronchitis in infants. In cases of severe bronchitis in which bronchopneumonia is feared, it is of prophylactic value. Because of its lower toxicity it is better than ethylhydrocupreine hydrochloride for internal use. Its rectal administration in the form of suppositories is to be recommended for infants and gives good results in adults. The harmful secondary effects frequently observed following the use of ethylhydrocupreine hydrochloride are rarely observed following the use of ethylhydrocupreine; they may always be avoided by prescribing the drug in suitable doses and particularly by using fractional doses and making the limit of the duration of the cure three days.

Vaccination Against Diphtheria.—For combating diphtheria Audeoud recommends vaccination with Ramon's anatoxin. He states that infants should be vaccinated against diphtheria with anatoxin at the age of 2 years.

Archivio Italiano di Chirurgia, Bologna

24: 253-364 (July) 1929

Postoperative Fistulas of Duodenum Resulting from Extraduodenal Interventions. G. Razzaboni.—p. 253.
Modifications in Form of Laryngotracheal Tube Resulting from Late Removal of Tracheotomy Cannula. L. Pietrantoni.—p. 305.
*Operative Removal of Emboli from Brachial Artery. V. Cocuzza.—p. 328.
Aseptic Embolus in Relation to Indications for Embolectomy. M. Loreti and G. Sandrini.—p. 339.
Surgical Treatment of Diabetes by Enervation of a Suprarenal. M. Donati.—p. 357.

Operative Removal of Emboli from Brachial Artery.—Cocuzza reports two cases of embolectomy. One patient, a woman, aged 67, had recovered two months previously from bronchopneumonia. One evening, she was suddenly seized with a lancinating pain throughout the whole length of her left arm, noting at the same time formication and a sense of chilliness in the arm. The author first saw her three days after the onset of the symptoms. Examination of the left arm revealed dark blue coloration in all five fingers—the finger tips were almost black. The sensitiveness of the skin had disappeared in the whole hand and was diminished in the rest of the arm; the forearm and the arm showed the typical marbled appearance. The patient was operated on the same day. The brachial artery was exposed at its origin. Near its origin, namely, where the pulsation ended, a foreign body could be felt within the artery. At operation an organized embolus about 1 cm. in length and of the thickness of the lumen of the artery was found blocking

the lumen of the vessel. The embolus was removed with ordinary forceps. At the close of the operation, the radial pulse, which had been suppressed, could be felt, though still small and weak. The patient survived, though Cocuzza is of the opinion that what saved the arm and the hand (the fingers had to be amputated six weeks later), was the collateral circulation through the profunda artery of the arm, which fortunately remained patent. In the second patient, a woman, aged 44, the same technic as in the first case was applied to the brachial artery, but the artery was empty. With a long sound the operator probed the vessel up to the clavicle, but only a few drops of blood came out on withdrawal of the instrument. Cocuzza hesitated to open other arteries in view of the patient's condition and so closed the wound. Two days later, the patient felt the same acute pain, this time in the left leg. On the third day, she died suddenly, probably from a cerebral embolus.

Clinica Chirurgica, Milan

32: 729-831 (July) 1929

Evolution of War Surgery. B. Rossi.—p. 729.
Giant Cell Tumors (Myeloplaxomas). A. Austoni.—p. 755.
*Various Indications as to Method in Radical Treatment of Femoral Hernia. G. Marchetti.—p. 779.

Modification in Radical Treatment of Femoral Hernia.—As Marchetti was preparing to operate on a woman who, for the third time, presented a recurrence of an enormous right femoral hernia, he conceived the idea of combining two important curative methods: that of Ruggi and that of Parlavecchio. He decided to fix as high as possible the pedicle of the sac and to suture to the posterior margin of the ring a strong layer that would lead to the obliteration of the ring itself to the internal side of the vessels of the femoral ring. In order to attain his purpose, only the inguinal route could be employed. This permitted him to ligate the sac very high up and also to suture it up high. The Parlavecchio procedure met his needs best. By this combined method Marchetti has obtained results that have stood the test of time in cases in which other surgeons had been unable to prevent recurrences.

Pediatria, Naples

37: 855-910 (Aug. 15) 1929

*Diagnostic Value of the Takata-Ara Test. M. Miraglia.—p. 855.
Changes in Reticulo-Endothelial System in Infantile Leishmaniosis. F. De Capua.—p. 869.
Feeding of Tadpoles with Various Normal and Irradiated Milks. U. Ferri.—p. 881.
Spontaneous Pneumothorax in Child Aged Two. P. Iacchia.—p. 901.

Diagnostic Value of the Takata-Ara Test.—Miraglia concludes from his trials of the Takata-Ara test that (1) the test employs a simple reagent, the technic is easy to apply, and it deserves to be used, along with other tests, in the diagnosis of cerebrospinal disorders; (2) a negative result of the test justifies the exclusion of an increase of albumin and of globulins; (3) the meningitic type of reaction testifies to an increase in the albuminoid content, which indicates inflammation of the meninges; (4) the metasyphilitic type, joined with an increase of the globulin fraction, is an indication of the syphilitic nature of the disorder, and (5) since the lack of the last mentioned type of reaction does not exclude a syphilitic origin of the disorder, it is necessary to use also, at the same time, the Wassermann test and other serologic tests.

Riforma Medica, Naples

45: 1071-1099 (Aug. 10) 1929

Visceral Polysclerosis; Mediastinitis. G. Zagari.—p. 1071.
Transmutation of an Anhemolytic Streptococcus Aviridans into a Hemolytic Streptococcus, in Malignant Endocarditis with a Slow Course. A. Ceresoli.—p. 1074.
*Traumatic Aseptic Meningitis. E. Capecchi.—p. 1078.

Traumatic Aseptic Meningitis.—Capecchi reports a case of aseptic purulent meningitis, demonstrated bacteriologically as such, which developed a month after a traumatic lesion at the base of the cranium and recurred thirty days after a clinical recovery, in a man, aged 22 years, previously well. He discusses the subject of aseptic meningitis of a medical and surgical nature, and takes up the etiology of the form that he attributes to a focus of cranio-encephalic traumatism, moderately infected, capable of provoking an aseptic reaction through contact in the meninges. In closing, he states that the prognosis in such cases of meningitis cannot be based simply on the asepticity of the spinal fluid and on the integrity of the polynuclear elements in it, but must consider the complex of the clinical manifestations as compared with the results of the laboratory examinations.

Boletín de la Soc. de Obst. y Ginec., de Buenos Aires

8: 115-144 (July 10) 1929

Osteartheritis of Both Hip Joints and Subluxation of Left Hip Following Puerperal Infection. J. Bazan and B. A. Viola.—p. 116.
*Painful Dysmenorrhea Treated by Resection of Superior Hypogastric Plexus. E. A. Fox.—p. 126.
Recurrent Vesicovaginal Fistula: Transperitoneal Operation. E. Nicholson.—p. 138.

Painful Dysmenorrhea Treated by Resection of Superior Hypogastric Plexus.—Fox has treated nine patients, aged from 18 to 26 years, with painful dysmenorrhea, which in some cases was associated with other conditions, such as dyspareunia and frigidity, by resecting the superior hypogastric plexus. Six of the patients had been married for some time but were childless. In all these cases, sympathectomy gave good results. Three patients became pregnant. Of three unmarried women, only one received benefit from the operation. The author believes that resection of the hypogastric plexus is indicated in painful dysmenorrhea when other treatment has failed to give relief.

Archiv für klinische Chirurgie, Berlin

155: 547-718 (Aug. 9) 1929

*Problems in Treatment of Acute Nontuberculous Pleural Empyema. R. Demel.—p. 547.
Experimental Pulmonary Embolism in Dogs Studied with Aid of Cinematograph. B. Martin.—p. 577.
New Plastic Operation for Hypospadias. H. Meyer.—p. 588.
Denervation of Heart: Experimental Study. F. Lampert.—p. 597.
Etiology of Anomalies of Teeth and Their Occlusion. C. Scheidt.—p. 602.
*Morphology of Exophthalmic Goiter Under Treatment with Compound Solution of Iodine: Anatomy and Clinical Effect. A. Troëll.—p. 614.
*Circulation of Skin and Muscle Flaps in Osteoplastic Amputations on Lower Extremities. A. Chasin.—p. 630.
Vascularization of Skin Scars. N. A. Gurewitsch.—p. 649.
Angioma of Vertebrae: Symptoms and Diagnosis. K. Makrycostas.—p. 663.
*Inheritability of Multiple Cartilaginous Exostoses. S. A. Pokrowsky.—p. 669.
Carcinoma of Esophagus: Operation with Aid of Endoscopy. A. Seiffert.—p. 675.
Teratoma of Thymus: Successful Removal. G. Wolfsohn.—p. 680.
Torsion of Third Omentum. D. von Klimkó.—p. 685.
Pseudomyxoma of Appendix (with Myxoglobulose). E. Hudacsek.—p. 694.
Tuberculoma of Central Nervous System. P. Schidlowsky.—p. 703.
Plastic Repair of Large Defects of Capsule of Knee Joint. J. Volkmann.—p. 714.

Problems in Treatment of Acute Nontuberculous Pleural Empyema.—Demel reviews the literature on the subject since the time of Hippocrates. On the basis of his personal experience in seventeen cases, he advocates the use of a specially devised apparatus for repeated airtight aspirations. The results of the bacteriologic examination are of importance for the prognosis of the duration of the disease. In obdurate cases which do not yield to puncture, especially in children, the Bülau siphon method (in adults combined with use of the aspirator) is recommended. As a postoperative treatment, systematic exercises of the still elastic lung, according to the method of L. Hofbauer, should aid in its expansion. Only after failure of this treatment should thoracotomy with resection of the ribs be performed, preferably at a period when the mediastinum has become more fixed and the danger of a displacement is removed. The immediate opening of the thorax in a pneumatic chamber is indicated solely in cases of pleural septicemia.

Morphology of Exophthalmic Goiter Under Treatment with Compound Solution of Iodine.—In 147 patients treated according to the method of Plummer before thyroidectomy, Troëll made the following observations: The severity of the thyrotoxicosis determines the duration of the treatment. Microscopically, he divides the cases into four groups. The first group (twenty-four cases) presented the picture of a simple colloid goiter; the second group (fifty-two cases) presented the same structure, except for interspaced small islands resembling the structure of the thyroid in exophthalmic goiter. Thirty-seven cases showed the structure of exophthalmic goiter with

inclusions of colloid structure. Thirty-one cases were throughout typical of exophthalmic goiter. Various types of transitional forms were evident in each group. The indication for surgical intervention was given by an increase in the body weight (decrease in the basal metabolism). The author emphasizes the fact that the daily increase in weight during the period of treatment with compound solution of iodine was greatest (0.087 Kg. on the average) in patients in whom the anatomic changes produced in the thyroid by the treatment, and noted in the specimen removed at operation, were not marked, and was least (0.033 Kg.) in patients in whom such changes were absent.

Circulation of Skin and Muscle Flaps in Osteoplastic Amputations on Lower Extremities.—Chasin studied the blood circulation by means of a method devised by Schor and himself and based on the injection of bismuth and glycerin into the largest vessel of the extremity; this serves to render the smallest vessels visible in the roentgenogram. As a result of his observations, he draws the following conclusions. Pirogoff's osteoplastic flap, developed on a bony pedicle, contains more blood vessels than a flap made only of soft tissue. Experimental ligature of the posterior tibial artery, even with partial resection of the artery, did not change the index of blood supply, which was from 5 to 10 per cent lower than normal. Cutting through the posterior tibial artery and the peroneal artery causes a decrease in pressure in the vessels of the flap. The method of osteoplastic treatment according to Abraschanow consists of taking the flap from the flexor surface of the knee. As compared to the normal blood supply the index is diminished from 10 to 15 per cent. The index, using Gritti's or Sabanejew's technic, is irregular and considerably lower. The Bier flap, taken from the anterior inner surface of the leg, contains the most vessels at the site of the plate of bone; in the rest of the flap the index is considerably lowered.

Inheritability of Multiple Cartilaginous Exostoses.—Pokrowsky studied this occurrence in eighteen members of one family. He concludes that this disease originates from an hereditary pathogenic agent causing defective development of the entire osteogenic layer. This is demonstrated by inhibition of growth, asymmetry, shortening of the bones, crookedness, luxations or the development of multiple cartilaginous exostoses. The transmission follows the mendelian law. Pokrowsky states that a correct name for the disease would be "osteodysplasia exostotica."

Beiträge zur Klinik der Tuberkulose, Berlin

72: 97-216 (June 24) 1929

*Value of Vaccinations with B C G, Schröder's Vaccine and Killed Tubercle Bacilli. O. Kirchner and H. F. Newton.—p. 97.
*Value of Vaccinations with B C G and Schröder's Vaccine. O. Kirchner and E. A. Schnieder.—p. 109.
*Inefficacy of B C G Vaccination in Monkeys. H. H. Kalbfleisch and A. Nohlen.—p. 121.
Frequency of Tuberculosis. W. Huber.—p. 147.
Bilateral Pneumothorax. J. E. Kayser-Petersen.—p. 165.
*Bactericidal Chemotherapy of Tuberculosis. F. Jessen.—p. 184.
Prognosis in Disseminated Productive Tuberculosis of Apex of Lung. H. Edel and H. Adler.—p. 187.

Value of Vaccinations with B C G, Schröder's Vaccine and Killed Tubercle Bacilli.—In experiments on 120 guinea-pigs Kirchner and Newton found that animals treated previously with subcutaneous injections of B C G were definitely protected against an infection that was sufficiently virulent and large to produce in control animals an inoculation tuberculosis of rapid evolution; the protection manifested itself in the form of an interval of three months between the time of inoculation and the time of appearance of the involvement of the regional lymph nodes. A relation between the local reaction at the point of injection of B C G and the duration of the protection was noted as follows: When the area of reaction had decreased in size to a certain circumference there occurred definite enlargement of the lymph nodes. On palpation the area of reaction was found to be a hard infiltration. A definite increase in the resistance to tuberculous infection could not be demonstrated in guinea-pigs treated previously with Schröder's vaccine and with killed tubercle bacilli.

Value of Vaccinations with B C G and Schröder's Vaccine.—In experiments on twelve monkeys Kirchner and Schnieder found that animals treated previously with large subcutaneous injections of B C G showed a definite but transient increase in resistance to intracutaneous infection with medium-sized doses of a virulent strain of tubercle bacilli. The protection conferred by the vaccination was manifested by a delay of several weeks in the appearance of the enlargement of the regional lymph nodes. The increased resistance paralleled the duration and intensity of the local reaction produced by the injections of B C G. A definite increase in the resistance to tuberculous infection could not be demonstrated in monkeys treated previously with Schröder's vaccine.

Inefficacy of B C G Vaccination in Monkeys.—Kalbfleisch and Nohlen give a detailed report of their experiments on thirty monkeys. They state that the only difference in the susceptibility to infection was noted in animals kept in cages and in animals kept in pens. Five of eight B C G monkeys and five of eight control monkeys that were kept in cages with tuberculous monkeys developed tuberculosis whereas all of three B C G monkeys and three control monkeys kept in pens with tuberculous monkeys remained healthy. The authors emphasize the fact that the amount of B C G injected, the mode of injection and the length of the interval between vaccination and exposure are of no importance in the resistance or lack of resistance of monkeys to tuberculosis.

Bactericidal Chemotherapy of Tuberculosis.—In several guinea-pigs with advanced tuberculosis Jessen injected intravenously 5 cc. of an aqueous solution containing 10 per cent of fuchsin and 3 per cent of salicylic acid biweekly until five injections had been made; the animals were then killed and examined. In spite of the fact that the entire lungs were stained by the fuchsin and in spite of the fact that control staining showed the presence of great numbers of tubercle bacilli, none of the bacilli were stained by the fuchsin injected intravenously. It was noted, however, that the fuchsin had penetrated into some of the small areas of necrosis. The author emphasizes the fact that in this problem even the smallest positive result is more important than a negative result because it proves that it is possible for substances injected into the blood stream to penetrate into small areas of necrosis in the lungs. Although he was unable to demonstrate it experimentally, he believes that if repeated intravenous injections of a drug are made in pulmonary tuberculosis while the areas of necrosis are still small, a union between the drug and the tubercle bacilli in the lung is possible.

Deutsche medizinische Wochenschrift, Leipzig

55: 1407-1450 (Aug. 23) 1929

Viosterol (Irradiated Ergosterol) in Treatment of Rickets and in Tuberculosis. G. von Bergmann.—p. 1407.
Poisoning Due to Rectal Administration of Strophanthin. H. Führer.—p. 1408.
Necessity of Clinics for Study of Diseases of the Aged. R. Eiselt.—p. 1409.
Hyperventilation in Relation to Blood Pressure. W. Raab.—p. 1411.
Dysentery Epidemic Caused by Bacillus Kruse-Sonne. P. Grosser.—p. 1412.
*Complications in Scarlet Fever and Serotherapy. F. von Bormann.—p. 1414.
Harmful Effects of Roentgen and Radium Rays? H. von Spindler.—p. 1417.
*Treatment in Spasm of Mammilla. R. Zimmermann.—p. 1418.
Traction Bandage with Adhesive Tape. B. Kienle.—p. 1421.
Analysis of Intracutaneous Potassium Ferricyanide Reaction According to Brugsch. H. von Versen.—p. 1422.
Idem. T. Brugsch.—p. 1422.
Diagnosis and Treatment of Descending Catarrh. W. Uffenorde.—p. 1423.

Effect of Serotherapy on Scarlet Fever and Its Complications.—Von Bormann investigated the scarlet fever problem, and especially the effectiveness of serotherapy, during a scarlet fever epidemic in 1926 and 1927. His report is based on the study of 886 cases. Serotherapy was employed in 619 cases. In discussing the clinical aspects of the disease the author asserts that there are two periods in the course of scarlet fever. The first one, extending over the first seven or ten days, is characterized by a toxicosis. During the second period septic complications become manifest. Serotherapy is effective only if the serum is injected during the first five days. From twelve to thirty-six hours after the injection, the symptoms of the initial toxicosis disappear almost completely, the already existing complications take a milder course and the frequency of later complications is reduced. These favorable

results of serotherapy are due to the fact that the antitoxin destroys the exotoxins of the streptococci. If these exotoxins are not destroyed, they favor septic invasion. However, if the serum is injected after the toxic period, or if the injection is made in cases in which the initial toxicosis is only of a mild degree, serotherapy has no effect. On the contrary, it even increases the virulence as well as the frequency of the complications. This may be explained as being due to the fact that the serums which are employed in the serotherapy of scarlet fever contain only antitoxic but not bactericidal substances. If toxicosis does not exist, the serum has the effect of a foreign protein; that is, it reduces the patient's power of resistance and promotes the septic process. In the absence of a serum with bactericidal qualities, the complications cannot be influenced directly. They can be counteracted only by combating the scarlet fever during the period of the initial toxicosis. The author directs attention to the fact that a serum which does not contain a sufficient amount of antitoxin should not be used, because it promotes the septic invasion instead of counteracting it. In mild cases, the serotherapy is omitted. However, it is pointed out that a case should not be too easily diagnosed as being mild, because cases which on the first day appear mild frequently become extremely toxic on the second or third day.

Treatment of Spasm of Mammilla.—Zimmermann observed spasm of the mammilla in a woman in the fourth month of pregnancy. Exposure to cold caused severe pains in the breasts. The mammilla became white and hard, and the pains radiated toward the axilla. The disturbance was so severe that the woman did not dare to leave her home. Warm applications brought only temporary relief. The author points out that other authorities have recommended quinine for the treatment of this condition. However, quinine has ecbolic effects and therefore cannot be administered to a pregnant woman. The author prepared an atropine ointment for local application on the mammilla. For oral administration he prescribed a mixture of calcium lactate and sodium lactate. This method of treatment gave good results. After a few days the painful attacks ceased and they did not recur during the severe winter weather. Later the ointment was applied only in the morning. During the puerperium and during the period of lactation only a few mild attacks recurred, but treatment was not necessary. The author points out that this method of local therapy is not suited for puerperal women or for nursing mothers. For such cases he recommends treatment with quinine. He thinks that the term "spasm of the mammilla" characterizes the disease better than the term "vasomotor neurosis of the mammilla."

Deutsche Zeitschrift für Nervenheilkunde, Leipzig

109: 1-119 (July) 1929

Tendency to Assume Most Comfortable Position in Lesions of Cerebellum and Frontal Lobe of Cerebrum. K. Goldstein.—p. 1.
Technic of Wassermann Test: Value of Positive Reaction of Blood in Diagnosis of Nervous Conditions. F. Plaut.—p. 62.
Causes of Meningism After Lumbar Puncture. V. Palcsó.—p. 71.
*Diagnostic Value of Hand Reflex of Juster. G. Perémy.—p. 77.
*Multiple Neuritis Following Carbon Monoxide Poisoning. B. N. Mankowsky.—p. 84.

Diagnostic Value of Hand Reflex of Juster.—Perémy studied the diagnostic value of Juster's reflex (hand reflex resembling Babinski's reflex) in fifty patients with lesions of the pyramidal tract. Only one of these gave the reflex as described by Juster. Four others presented partial reflexes, whereas in the remaining patients characteristic reactions were not observed. The value of joint reflexes in the upper extremities is greatly decreased by their greater dependence on the cortex of the brain as compared to the lower extremities. As there is no normal hand-finger reflex, one cannot expect a reversed phenomenon. From a review of the literature on the subject and his personal experience, Perémy concludes that although the joint reflex of Léri and that of Mayer may be used, Juster's reflex is vastly inferior in diagnostic value to other more characteristic and constant symptoms of pyramidal lesions.

Multiple Neuritis Following Carbon Monoxide Poisoning.—Mankowsky discusses this occurrence on the basis of the literature on the subject and his personal experience. The case reports of seven of his patients are given, each of whom, although presenting somewhat different symptoms, was believed to have a disturbance of the peripheral nerves and vessels together with hemorrhage. Certain mechanical and traumatic factors may explain the disturbance of the circulation of blood in the extremities or other parts and the resulting hemorrhage in individual cases. Mankowsky concludes that multiple neuritis following carbon monoxide poisoning results from the compression of nerves by a hemorrhage originating from the fragility of the vessels and from the infiltration of the epineurium and the perineurium with blood and the ensuing formation of scars and ischemia of the nerves. This may occur in any nerve trunk. In most cases a number of nerves are involved. The prognosis is favorable, on the whole; thermotherapy, especially diathermy, in the region of the suspected hemorrhage is indicated. The comparatively rare occurrence of multiple neuritis may in reality be a failure to recognize mild forms. This is possible in cases with edema of the extremities or with thickening of muscles due to hemorrhage.

Klinische Wochenschrift, Berlin

8: 1601-1648 (Aug. 27) 1929

Peculiarities of Metabolism During Childhood. E. Helmreich.—p. 1601.
*Significance of Organs of Mesenchymal Origin for Capacity of Resistance of Organism Against Bacterial Infections During Period of Growth. W. Frey.—p. 1604.
*Antagonism Between Rous Sarcoma and Tuberculosis. O. Teutschlaender.—p. 1606.
Regulation of Reaction of Chyme. H. Brühl and E. Freudenberg.—p. 1608.
Icterus Neonatorum and Pathogenesis of Anhepatic Icterus. H. Jacoby.—p. 1611.
*Acute, Dangerous Decrease of Oxygen in Arterial Blood in Pulmonary Tuberculosis. F. Pomplun.—p. 1613.
Diffuse Symmetrical Lipomatosis. W. Löwenstein.—p. 1614.
*Sedimentation Speed and Blood Picture in Nervous Diseases. R. Grün.—p. 1618.
Enlargement of Heart in Congenital Arteriovenous Communication. H. Rösler.—p. 1621.
Color Photography of Fundus Oculi. K. Wessely and E. Wertheimer.—p. 1624.
Action of Lecithin on Carbohydrate Metabolism. G. Izar and S. Costantino.—p. 1624.
Development of Metastrongylus Elongatus: Its Occurrence in Man. A. and M. Hobmaier.—p. 1625.
Nontropical Sprue. E. Scherer.—p. 1625.
Peculiarities of Circulation During Childhood. L. Doxiades.—p. 1627.

Significance of Organs of Mesenchymal Origin for Capacity of Resistance of Organism Against Bacterial Infections During Period of Growth.—Frey directs attention to the fact that during infancy the susceptibility to infectious diseases is relatively low, but if a disease is once contracted, the mortality is comparatively high. During the time of growth, however, the susceptibility of the organism to various infectious diseases is not lowered, but because the body has a maximal capacity for reaction, the seriousness of the infection is minimal. In the attempt to explain this phenomenon, the author points out that the process of growth differs widely in the various organs. The full grown human body is about twenty times the size of the new-born infant. In the musculature, bones, genital organs and suprarenals, the coefficient indicating the growth is considerably above 20. The lungs and the digestive organs keep pace with the general growth, but the size of the brain and of the eyes increases much less. The brain reaches nearly its full development during the first ten years of life, the heart, spleen, thymus and musculature during the second decennium, and the testes, ovaries, thyroid, hypophysis, suprarenals, lung and liver during the third decennium. The author thinks that endogenous and embryonal factors are of influence on these differences in growth. During the age period from 5 to 15 years, that is, during the time when the organs of mesenchymal origin, such as the spleen and thymus, show their most intense development, the body manifests the greatest resistance to infectious diseases.

Antagonism Between Rous Sarcoma and Tuberculosis.—Teutschlaender points out that cancer often develops in patients with tuberculosis. Cancerous growths have been observed in patients with lupus or with chronic pulmonary tuberculosis. In these cases the tuberculous process is generally the primary condition. These conditions seem to indicate that there is not an antagonism between tuberculosis and cancer. However, the author reports observations which show that Rokitansky's theory of an existing antagonism between

the two diseases may, perhaps, apply to certain types of tumors. He made experiments with several strains of Rous sarcoma. In fifty-three of the eighty animals that had been inoculated with Rous sarcoma, the tumor grew normally. In the other twenty-seven animals, necropsy revealed abnormalities in the development of the sarcoma. The tumorous growth was entirely absent in eight animals, and in nineteen animals it developed only temporarily and poorly. In twenty-three of these twenty-seven animals the author noted a chronic tuberculosis either of the intestine or of the liver. He also points out that in the fifty-three animals in which sarcoma developed in the normal manner, tuberculosis could not be detected. From these observations he concludes that a causal relation exists between tuberculosis and immunity against Rous sarcoma. He expresses the hope that further investigations may reveal what processes are involved in this antagonism, and he thinks that eventually injections with milk or with tuberculin may prove to be of therapeutic value.

Acute, Dangerous Decrease of Oxygen in Arterial Blood in Pulmonary Tuberculosis.—Pomplun asserts that since the introduction of collapse therapy, the question has arisen whether a limitation of the respiratory area may cause a deficiency of oxygen and an increase in carbon dioxide in the arterial blood. The author examined the arterial blood of several hundred patients with pulmonary tuberculosis. In many cases he could demonstrate a marked deficiency in the oxygen and an increase in the carbon dioxide. He gives a detailed report of two cases in which it is shown that an inadequate supply of oxygen may lead to grave complications and even cause death. The author assumes that the oxygen shortage is probably the main cause of the weakness and fatigue in patients with pulmonary tuberculosis. He thinks that in the past this aspect of tuberculosis has not received sufficient attention.

Sedimentation Speed and Blood Picture in Nervous Diseases.—In order to determine whether the sedimentation speed and the blood picture could be employed for diagnostic purposes in diseases of the nervous system, Grün made tests on 300 patients. Concerning the persons with neurosyphilis, he states that in those who gave a positive Wassermann reaction, the sedimentation speed was generally increased. In patients who gave a positive Wassermann reaction, in spite of the fact that they had undergone antisyphilitic treatment, but in whom other syphilitic symptoms were not present, the sedimentation speed was normal. Whenever the Wassermann test gave negative results the sedimentation was normal, even in patients with paralytic symptoms. The condition of the cerebrospinal fluid had no influence on the sedimentation reaction. The blood pictures of these patients with neurosyphilis did not show abnormalities. Only in several patients with latent syphilis was lymphocytosis noted. In individuals with concussion of the brain, the sedimentation was retarded and the blood picture showed a lymphocytosis. Patients with chronic encephalitis nearly all showed an accelerated sedimentation speed. However, in the patients in whom the encephalitis was unilateral and localized, the sedimentation was normal. In cases of arteriosclerosis the sedimentation speed was nearly always increased. In patients with erythrocytosis or with aplastic pernicious anemia, the sedimentation was retarded. Only one person with aplastic pernicious anemia showed an accelerated sedimentation. The author thinks that the determination of the sedimentation speed might be of value in the difficult differential diagnosis between acute encephalitis and tumor of the brain. His observations showed that retarded or normal sedimentation indicates tumor. Increase in the sedimentation speed is characteristic for encephalitis. However, acceleration of the sedimentation speed does not always contraindicate the existence of a tumor of the brain. If the sedimentation speed is considerably increased, either acute encephalitis or a rapidly developing and degenerating tumor may be thought of.

Medizinische Klinik, Berlin

25: 1383-1418 (Sept. 6) 1929

Dietary Treatment in Pulmonary Tuberculosis. H. Strauss.—p. 1383.
Balneotherapy in Surgical Diseases. B. Wollmann.—p. 1387.
Influence of New Theory of Pathogenesis of Pulmonary Tuberculosis on Diagnosis and Treatment of This Disease. O. Laufer.—p. 1390. C'td.
Differential Diagnosis of Laryngeal Stenosis During Childhood. M. Boddin.—p. 1391.
Irradiation in Treatment of Cancer in Sweden. J. Granzow.—p. 1392.
Symptomatology and Diagnosis of Primary Sarcoma of Vertebra. V. Gorlitzer.—p. 1394.
*Rubescent Vision as Early Symptom in Uremic Diseases. E. Vinazzer. —p. 1395.
Heiss's Theory on Evacuation of Urinary Bladder. A. Friedel.—p. 1396.

Rubescent Vision as Early Symptom in Uremic Diseases.—Vinazzer reports three cases with disturbance of the urinary passages. The patients complained that at times everything became red before their eyes. All three developed uremia. The author concludes that rubescent vision is an early symptom of uremia. He thinks that the condition is due to changes in the fundus oculi. Whenever the differential diagnosis is difficult, this symptom may be considered as pathognomonic of uremia.

Münchener medizinische Wochenschrift, Munich

76: 1363-1404 (Aug. 16) 1929

*Dietary Treatment in Tuberculosis. F. Sauerbruch.—p. 1363.
*Conservative and Operative Treatment in Suppurative Infections. H. B. Hoppe.—p. 1363.
Evidence That Arsenic May Be Absorbed by the Skin: Experiences with Balneotherapy in Durkheim. J. Leva.—p. 1368.
Improvement of Gastroscope and Technic of Gastroscopy. R. Korbsch. —p. 1370.
*Sedimentation Speed of Erythrocytes in Diabetes Mellitus. Wisselinck. —p. 1373.
*Probable Causes of Endemic Goiter. Grassl.—p. 1375.
Treatment of Diabetes Insipidus by Endonasal Application of Pituitary Preparation. Hertmanni.—p. 1377.
*Treatment of Carbuncle of Neck. O. Pollwein.—p. 1377.
Harmful Effects of Plaster-of-Paris Cast and of Operative Treatment in Rheumatic Arthritis. W. Krone.—p. 1378.
*Treatment of Depressions of Skull in the New-Born and in Infants. H. Steudel.—p. 1379.
*Effective Method for Conservative Treatment of Tumors of Uterine Adnexa. B. Aschner.—p. 1379.

Dietary Treatment in Tuberculosis.—Sauerbruch directs attention to the fact that the report on the value of dietary treatment in tuberculosis, which was given recently before the Berlin medical society, had been sensationally exploited in the popular press. He regrets this, because many patients have given themselves to high expectations that in the end cannot be entirely realized. It is also to be feared that a truly promising method of therapy might be completely rejected on account of disappointments, which will surely follow sensational publicity.

Conservative and Operative Treatment in Suppurative Infections.—Hoppe thinks that in suppurative infections, it has to be decided in each individual case whether conservative or surgical treatment is preferable. There are, however, certain general rules that apply to all suppurative infections. Rest is an absolute necessity. Consequently, a splint dressing is required for suppurative processes near a joint. In dressing the wounds, care should be taken that constriction, chafing and adhesions are avoided. In order to facilitate the changing of dressings the author recommends the use of ointments and of moisture. Moist bandages effect hyperemia, alleviate the pain and keep the wound clean. They are advisable especially in the treatment of panaris. However, for furuncles and for abscesses of the sweat glands, moist dressings are not advisable. During the acute suppurative stage of the wound process, the bandages should be changed daily. Later, the intervals between the changes may be longer. The author gives detailed instructions for the treatment of the various types of suppurative processes. He advises conservative therapy for furuncle of the face, erysipeloid, panaris of a joint, cutaneous panaris and beginning paronychia. In such cases autohemotherapy has likewise proved valuable. Operative treatment is recommended for acute, localized paronychia, for most cases of panaris and for phlegmon. A combination therapy of operative and conservative methods is advisable in inflammation of the lymph nodes or of the sweat glands, and also in mastitis and in furuncles. The value of heat and of certain dietary treatments is likewise discussed by the author. He also gives advice for the prevention of suppurative processes.

Sedimentation Speed of Erythrocytes in Diabetes Mellitus.—In order to determine whether the sedimentation speed of the erythrocytes is influenced by the sugar content of the blood and the urine, or by insulin injections, Wisselinck

made tests in sixty-three patients with diabetes mellitus. From the results of his observations he draws the following conclusions: The sedimentation speed of the erythrocytes is not dependent on the clinical aspects of the disease. Acidosis reduces the sedimentation speed to a certain extent. In cases of a high sugar content in the blood and in the urine, the sedimentation speed is frequently reduced. However, in some instances, the blood sugar seems to have no essential influence. The effect of insulin on the sedimentation speed of the erythrocytes is not lasting. Only in one instance was a considerable reduction noted. Tests that were made two hours after the insulin injection gave varying reactions. In two instances a marked reduction was noted. Examinations that were made twenty-four hours after the insulin injection proved that the reduction of the blood sugar content parallels an increase in the sedimentation speed. In tests that were made during the first and second hour after the insulin injection and in those that were made twenty-four hours later, the reactions differed somewhat from those in the patients who did not receive insulin. The sedimentation speed of the erythrocytes in diabetic patients is not of prognostic value.

Probable Causes of Endemic Goiter.—Grassl points out that the deficiency in iodine cannot be the only cause of the goiter that is endemic in the Alps. He compares the goiter that occurs in the Alps with the goiter that is observed in oceanic regions. He then discusses several other factors that might have some bearing on the development of goiter, especially irradiation, which in turn is influenced by the altitude, by the moisture content of the air and by seasonal conditions. The author concludes that the goiter problem may be explained by abnormalities in metabolism. In this metabolism the chemically active rays represent the motor power, and the iodine represents the working stock. Both these factors mainly influence the water metabolism. Under normal conditions these factors are in labile equilibrium. If the adjustment is disturbed by local and by seasonal conditions, endemic goiter may develop.

Treatment of Carbuncle of Neck.—Pollwein states that patients with carbuncles should be treated in a hospital rather than in the physician's office or in the home, because in the hospital there are all the facilities that make a proper treatment possible. The author then describes a technic which has given satisfactory results. The carbuncle is completely laid open by a horizontal incision that goes parallel with the natural lines in the skin. Additional incisions are made vertical to the first incision. This method is said to be superior to the crucial or starlike incisions, because it does away with the narrow, pointed skin flaps that usually become necrotic; it gives better cosmetic results, and it also shortens the period of treatment. To make the operation painless, it is performed under ethyl chloride narcosis. A local anesthetic is not sufficient. After proper surgical treatment frequent changing of the dressing will not be necessary. The first tampon may remain about ten days. For the after-treatment the author recommends suture of the incision. Eight days later the wound is healed enough so that further treatment will not be necessary.

Treatment of Depressions of Skull in the New-Born and in Infants.—Steudel directs attention to a method of treatment which he employed in 1895. A boy, aged 2 months, fell and sustained a skull depression 5 cm. long, 2.5 cm. wide and 2.5 cm. deep. The author constructed a suction apparatus, with which it was possible to bring the depressed bone into its natural position. In the years following, the child developed normally. In 1917, the author had an opportunity to examine the patient again. The physical examination revealed no abnormalities. However, according to the statement of the parents, the mental development had been somewhat retarded. The author considers this a result of the trauma. He concludes that such depressions of the skull are not entirely harmless, and that they require treatment like other fractures.

Effective Method for Conservative Treatment of Tumors of Uterine Adnexa.—Aschner directs attention to the disadvantages of surgical treatment in tumors of the uterine adnexa. He asserts that the mortality is relatively high. Moreover, radical operation does not always eliminate all troubles, and the resulting premature menopause is also often the cause of disturbances. The author states that tumors of the uterine adnexa should be treated in a conservative manner, whenever it seems possible. He then describes the method which he employed successfully in many instances. From five to ten leeches are applied to the lower part of the abdomen. In unilateral processes they are applied only on the affected side. The pain and swelling nearly always disappear shortly afterward. The author employed this method for gonorrheal and puerperal tumors of the adnexa, and in pyosalpingitis, parametritis, perimetritis and pelviperitonitis. He points out that leeches have been employed with success in inflammatory processes of the testis. Another valuable aid in the treatment of tumors of the uterine adnexa is mild mercurous chloride, given two or three times daily, in the form of pills or powders. Vaginal suppositories likewise proved effective. The author gives a detailed report of several cases in which these conservative methods brought good results. In some instances an operation was not needed after this therapy. In other cases vaginal incision or resection of the diseased tube was done. However, total extirpation or supravaginal amputation was never necessary. It was always possible to conserve the uterus and at least one ovary.

Wiener medizinische Wochenschrift, Vienna

79: 1139-1164 (Aug. 31) 1929

*Skin Diseases in Children: Their Relation to Internal Disturbances. C. Leiner.—p. 1139.
Billroth's Theory on Pathogenesis of Cancer of Mamma. H. Schramm.—p. 1144.
Indications of Fitness for Life in Tropical Regions. K. Ullmann.—p. 1145.
Diagnosis and Treatment of Nonspecific Chronic Inflammatory Granuloma Extending to Internal Organs. H. Hufnagl.—p. 1148.
Protective Measures in Use of Roentgen Rays. A. Schönfeld.—p. 1153. C'td.

Skin Diseases in Children: Their Relation to Internal Disturbances.—Leiner describes various forms of skin diseases that occur in infants and children. He shows that dermatitis generally appears as a result of an internal disturbance. He traces toxic erythema neonatorum to dyspepsia, to inflammatory processes in the oral cavity or to toxic influence during the prenatal period. Other skin diseases in infants and children are the result of septic processes. The author mentions particularly ecthyma gangrenosum. Nutritional disturbances often lead to furunculosis or to ecthyma cachecticorum. A form of scurvy often becomes manifest in children whose food is deficient in vitamin C. The skin of such patients is pale and sallow and shows hemorrhagic areas. The author further mentions ammonia dermatitis, which is localized mainly in the gluteal region. It is caused by *Bacillus ammoniagenes.* Another dermatitis of the gluteal region is often observed in children with thrush. This form is caused by *Monilia albicans.* Strophulus, probably the most common skin disease in infants and children, usually affects overnourished children with gastrointestinal disturbances and constipation. A macular exanthem is frequently noted in children with pyelocystitis. Pseudojaundice becomes manifest in infants who have been fed with carrots. In cases of inflammation of the cardiac valves, erythema gyratum often develops and erythema annulare is noted in patients with acute endocarditis. Erythema multiforme becomes manifest after an angina, in the course of articular rheumatism. Tuberculosis in children is often accompanied by erythema nodosum. Other skin diseases that are noted in tuberculous children are the various forms of lupus and of scrofuloderm, and also miliary tuberculosis. Diseases of the central nervous system are also frequently accompanied by skin diseases. In epidemic encephalitis a macular exanthem is often noted, and adenoma sebaceum occurs with tuberous sclerosis. Finally the author again stresses the fact that the skin is the mirror of the internal processes. In short, a dermatitis is generally the result of an internal disturbance.

Zeitschrift für Krebsforschung, Berlin

29: 435-548 (Aug. 3) 1929

*Cause of Cancer of Penis in China. E. A. Dormanns.—p. 435.
Microscopic Structure of Mouse Carcinoma. B. Lipschütz.—p. 440.
Microscopic Structure of Rat Sarcoma. B. Lipschütz.—p. 449.
Inoculability of Mouse Leukosarcoma. R. Korteweg.—p. 455.
Cancer of Thyroid with Metastases in Lung in a Specimen of Viverricula Malaccensis. T. Purmann.—p. 477.

*Value of Anaphylactic Reaction in Diagnosis of Cancer. N. I. Rosanow.—p. 484.
Basis for Malaria Treatment of Cancer. A. Braunstein.—p. 486.
Isolation of Blastogenic Principle in Rous Sarcoma. E. Fränkel and E. Mislowitzer.—p. 491.
Filtration of Blastogenic Principle in Rous Sarcoma. E. Fränkel.—p. 498.
Immunity in Rous Sarcoma in Chickens. E. Fränkel.—p. 501.
*Production of Serum with High Antibody Content. E. Fränkel.—p. 505.
*Infectiousness of Blood of Chickens with Rous Sarcoma. E. Ragnotti.—p. 510.
*Spontaneous Healing of Cancer. R. Frauchiger.—p. 516.

Cause of Cancer of Penis in China.—In a period of eighteen months in China Dormanns received for examination five specimens of cancer of the penis. Three of the specimens had been removed from men aged 24, 26 and 34 years, respectively. In the microscopic examination of the specimens the author noted that in all of them the cancer had developed on a greatly inflamed skin. In four of the specimens the microscopic changes resembled the changes found in experimental tar cancer. Extirpated inguinal lymph nodes had been sent with two of the specimens but they were found to be free from metastases. In searching for an explanation of the frequency, occurrence in young men and resemblance to experimental tar cancer of cancer of the penis in China, the author noted that gonorrhea, syphilis and particularly chancroid are treated there by the local application of highly irritant substances. Owing to his inability to obtain any of these substances he was unable to substantiate experimentally his suspicion with regard to their carcinogenic properties.

Anaphylactic Reaction in Diagnosis of Cancer.—In an attempt to find a test for cancer comparable to the Pirquet, Schick and Dick tests and the anaphylactic test for echinococcosis, Rosanow prepared two types of cancer extracts. In the one instance an adenocarcinoma of the mamma and an adenocarcinoma of the ovary were used according to the method of Seyderhelm and Lampe (extraction of the tumor with alcohol at 1.4 F.); in the other instance an extract was made with physiologic solution of sodium chloride, the extraction lasting from five to six days at a temperature of from 23 to 21.2 F. The extracts were passed through a Chamberland filter and the clear colorless fluid was placed in sterile ampules of dark glass at a temperature of about 32 F. The extracts were used in performing tests on twenty-one patients with cancer of the following organs: one of the lung, two of the mamma, two of the uterus, nine of the stomach, two of the esophagus, three of the liver, one of the peritoneum and the intestine and one of the stomach and the liver. In each of the patients 0.2 cc. of the extract and 0.2 cc. of physiologic solution of sodium chloride (as control) were injected into the skin of the shoulder. Of the twenty-one patients only three (one with cancer of the stomach, one with cancer of the esophagus and one with cancer of the liver) gave definite reactions with the two kinds of extracts. In consideration of the variability of the local and the general reaction of the same person to even the first injection of various unspecific proteins, the author considers that it would be superfluous to perform more experiments of this nature.

Production of Serum with High Antibody Content.—According to Fränkel the addition of homologous and heterologous lipoid to sheep's erythrocytes injected into a rabbit results in a specific hemolytic serum having two or three times the strength of the hemolytic amboceptor serum obtained with ordinary sheep's corpuscles.

Infectiousness of Blood of Chickens with Rous Sarcoma.—Ragnotti describes experiments in which he noted that the injection of blood from chickens with Rous sarcoma into the pectoral muscles of healthy chickens was followed by the development of Rous sarcoma in 50 per cent of them.

Spontaneous Healing of Cancer.—Frauchiger gives the following three requirements that must be fulfilled before the spontaneous healing of cancer can be demonstrated scientifically and unquestionably: (1) conformity between the clinical and the microscopic diagnosis; (2) known late results, and (3) postmortem examination. She states that in a review of the literature on the subject she was unable to find a single case of so-called spontaneous healing of cancer that fulfilled all three of the requirements.

Zentralblatt für Chirurgie, Leipzig

56: 2113-2176 (Aug. 24) 1929

Surgical Treatment of Syringomyelia. V. Schmieden.—p. 2114.
Advantages of Ombrédanne's Mixed Anesthesia (Rebreathing) Over His Ether Anesthesia. T. Fohl.—p. 2120.
Isolated Embolic Thrombosis of Hand Following Intravenous Injection of Salyrgan. R. Morian.—p. 2128.
*Hemostasis After Prostatectomy. J. Baumann.—p. 2132.
Operations Done with Operator in Sitting Position. H. Flörcken.—p. 2133.
Technic of Jejunostomy. A. Winkelbauer.—p. 2136.
Meckel's Diverticulum: Case. F. Trocki.—p. 2139.

Hemostasis After Prostatectomy.—Baumann describes the technic used at Rost's clinic in Mannheim. After operation a permanent catheter and a drain are inserted and continuous drop irrigation with physiologic solution of sodium chloride is begun. The bleeding is stopped by a rapid irrigation with 1 liter of a solution made by the addition of 10 cc. of a 10 per cent calcium chloride solution to 1 liter of physiologic solution of sodium chloride, followed by continuous irrigation as before. One or two irrigations with the calcium chloride solution are sufficient for producing hemostasis.

Norsk Magasin for Lægevidenskapen, Oslo

90: 941-1020 (Sept.) 1929

*Frequency of Nondiabetic Glycosurias. H. J. Ustvedt.—p. 941.
*Complications After Catheterization of Ureters and Pyelography. E. Borch-Johnsen.—p. 952.
*Effect of Nicotine on Blood Sugar Picture in Rabbits. R. Nicolaysen.—p. 957.
"Enterocleaner" and Application. H. F. Harbitz.—p. 967.
*Fulminant Erysipelas. E. Hjort.—p. 970.
*Pathogenic Basis for Iodine Treatment in Thyrotoxicosis. J. Holst.—p. 973.

Frequency of Nondiabetic Glycosurias.—Ustvedt found that 156, or 1.6 per cent, of 10,000 patients without diagnosed diabetes had glycosuria. Of sixty-two patients with accidentally discovered chronic glycosuria, fifty-five were diabetic. Of thirty-two cases of transitory glycosuria, fourteen were associated with cerebral disease. After grave hematemesis slight transitory hyperglycemia and glycosuria were sometimes seen. Among 206 cases of chronic glycosuria, including diabetes, there were five of glycosuria with cyclic hyperglycemia, and two of renal glycosuria, observed for nine and ten years, respectively. True renal glycosuria was revealed also in the mother and sister of one of these patients, and transitory glycosuria in two other children of the family.

Complications After Catheterization of Ureters and Pyelography.—Borch-Johnsen reports four cases of grave complications after catheterization of the ureters and bilateral pyelography, two with signs of infection and uremia and fatal outcome (one after cystoscopy and catheterization without pyelography), and two with long continued hematuria.

Effect of Nicotine on Blood Sugar in Rabbits.—Nicolaysen says that nicotine bitartrate injected subcutaneously into rabbits in doses of from 1.25 to 3.33 mg. per kilogram of body weight usually causes a slight, very transient hyperglycemia, and in doses of from 4.9 to 5.4 mg. per kilogram of body weight produces a rise in blood sugar of from 40 to 95 mg. per hundred cubic centimeters, without general symptoms. With further increase in dosage there is a constant rise in blood sugar, with general symptoms (pupillary contraction, tachypnea, muscular twitching), the symptoms being definite only on a dosage of about 15 mg. per kilogram of body weight.

Fulminant Erysipelas.—Hjort describes a case of violent streptococcic infection diagnosed as fulminant erysipelas, fatal in thirty-three hours.

Pathogenic Basis for Iodine Treatment in Thyrotoxicosis.—Holst treats of the action of iodine in primary thyrotoxicosis (exophthalmic goiter) and considers the changes in the blood and goiter produced by the iodine treatment of thyrotoxicosis according to Plummer. The thyroid has two functions, as follows: (1) the production of the secretion and (2) the storage of the secretion and the regulation of its discharge. Administration of inorganic iodine is believed to arrest the "thyroid diarrhea" or rapid discharge of the thyroid secretion into the blood in thyrotoxicosis. The relation between the inorganic iodine in the blood and the capacity of the thyroid to retain its secretion, called the "intermediary iodine balance," is discussed.